DOCUMENT RESUME

ED 109 952 HE 006 523

AUTHOR Mityataki, Glenn K.; Gray, Robert G.
TITLE Academic Unit Planning Manual Field Review Edition. Technical Report No. 72.
INSTITUTION Western Interstate Commission for Higher Education, Boulder, Colo. National Center for Higher Education Management Systems.
PUB DATE Jan 75
NOTE 182p.

EDRS PRICE MF-$0.76 HC-$9.51 PLUS POSTAGE
DESCRIPTORS Departments; Educational Administration; Educational Assessment; Educational Objectives; *Educational Planning; Faculty; *Higher Education; *Management Information Systems; Management Systems; *Modular Building Design; Planning; Resources; Systems Approach; *Unit Plan

ABSTRACT

This document is intended to provide a systematic aid for planning and managing academic units (schools, colleges, departments, or divisions) within an institution. It consists of a comprehensive set of techniques and procedures that can be used by academic unit administrators to examine the internal operations of their units--their functions, demands, faculty and financial resources, and outcomes. While implementation of this manual can occur at various levels within an institution, it is designed to focus on the academic departments. The document has been designed to be flexible in its use and to rely on the administrator's experience and judgments in applying the tools to examine various planning situations. It is organized into several "modules," each of which addresses a particular aspect of the overall planning and management process within academic units. Modules are: (1) structures module, (2) academic demand module, (3) faculty planning module, (4) finance module, (5) outcomes module. Appendixes describe: (1) contributions on NCHEMS products to the academic unit planning manual; (2) the NCHEMS program classification structure; (3) program measures; (4) completion of worksheet 3B, the faculty planning form; (5) inventory of higher education outcomes variables and measures. (Author/KE)

ACADEMIC UNIT PLANNING MANUAL

FIELD REVIEW EDITION

TECHNICAL REPORT NO. 72

January 1975

Glenn K. Miyataki

Robert G. Gray

The National Center for Higher Education Management Systems at
Western Interstate Commission for Higher Education
P. O. Drawer P Boulder, Colorado 80302

National Center for Higher Education Management Systems at WICHE

An Equal Opportunity Employer

The Western Interstate Commission for Higher Education (WICHE) is a public agency through which the 13 western states work together

- to increase educational opportunities for westerners.
- to expand the supply of specialized manpower in the West.
- to help universities and colleges improve both their programs and their management.
- to inform the public about the needs of higher education.

The Program of the National Center for Higher Education Management Systems at WICHE was proposed by state coordinating agencies and colleges and universities in the West to be under the aegis of the Western Interstate Commission for Higher Education. The National Center for Higher Education Management Systems at WICHE proposes in summary:

To design, develop, and encourage the implementation of management information systems and data bases including common data elements in institutions and agencies of higher education that will:

- provide improved information to higher education administration at all levels.
- facilitate exchange of comparable data among institutions.
- facilitate reporting of comparable information at the state and national levels.

Western Interstate Commission for Higher Education
Post Office Drawer P Boulder Colorado 80302

To the Postsecondary Education Community:

This field review edition of the Academic Unit Planning Manual is being sent to all postsecondary education institutions and agencies participating in the National Center for Higher Education Management Systems (NCHEMS) as a means to solicit comments regarding the contents and potential uses of the document.

This document is intended to provide a systematic aid for planning and managing academic units (schools, colleges, departments, or divisions) within an institution. It consists of a comprehensive set of techniques and procedures that can be used by academic unit administrators to examine the internal operations of their units--their functions, demands, faculty and financial resources, and outcomes. In order for this document to become a useful planning tool, it is necessary at this stage of the document's development that the NCHEMS staff receive critical feedback from all interested administrators.

We request that you circulate this edition within your institution to those academic unit administrators (deans, department administrators, division directors) and individuals who might be in the best position to review it critically and constructively. Any comments or suggestions on improving the document will be appreciated. Written comments may be in the form of letters or as notations in the document returned to the authors at the National Center for Higher Education Management Systems, P.O. Drawer P, Boulder, Colorado 80302. Please send in your comments by July 1, 1975.

Robert A. Wallhaus

Robert A. Wallhaus, Deputy Director
National Center for Higher Education
Management Systems at WICHE

PREFACE

This field review edition of the Academic Unit Planning Manual has been prepared by Glenn Miyataki and Robert Gray of the National Center for Higher Education Management Systems (NCHEMS) staff under the aegis of the Intra-Institutional Planning and Management project. Dr. James S. Dyer of the UCLA Graduate School of Management provided technical expertise during the early development of this document. Also, in 1972, Dr. Richard L. Featherstone of Michigan State University, was a Visiting Scholar at NCHEMS and his research efforts resulted in The Development of Management Systems for the Academic Department which served as background for this document. At this stage of development, the Academic Unit Planning Manual has been carefully reviewed by: (1) the NCHEMS staff, (2) several individuals (see Acknowledgments) from various higher education institutions throughout the country, (3) Dr. Paul Dressel of Michigan State University and Dr. Stephen Hoenack of the University of Minnesota as independent technical consultants, and (4) administrators from Ball State University and the University of Minnesota who participated in the field development of the document (see Acknowledgments) during July-November 1974.

This document will undergo a pilot test in the Spring and Summer of 1975 in a small number of postsecondary education institutions and a mail review by the NCHEMS constituency. The results of the field review and pilot test will be considered and incorporated as appropriate in the Academic Unit Planning Manual before it is published in late Fall 1975.

It is most important to note that this planning manual does not prescribe standards for academic unit planning, nor does use of the manual imply that information about academic units should be exchanged. Any academic unit that intends to implement this manual for information exchange purposes must establish its own conventions and procedures.

This preliminary publication does not necessarily reflect an official position of NCHEMS, WICHE, or the National Institute of Education under whose contract this document is being developed.

ABSTRACT

The Academic Unit Planning Manual will assist in planning and managing the scope and direction of an academic unit's* functions. The manual will help in the identification and organization of data about academic unit functions, the availability and allocation of human and physical resources, the sources and uses of funds, and the planning and assessment of outcomes. Included are several analytic techniques that facilitate the examination of alternatives regarding the allocation of resources, for example, the analysis of various faculty/activity assignments, determination of expected student enrollments, and the uses of financial resources.

The planning manual can be used to address such questions as, How much and what kinds of resources will be consumed by the community service activities conducted by the Home Economics Department? What is the expected student demand if a new course in accounting is established? How many students can be expected to take Educ. 550 during Fall 1975, and from which departments may they come? What are the planned outcomes of the department? How many faculty are needed to staff adequately the projected teaching, research, public service, and administrative functions of the unit?

*For purposes of this manual, the term "academic unit" will be used to describe the basic organizational unit within which educational activities such as instruction, research, public service, student counseling and so forth are carried out. For some institutions this would be the academic department; for others division; and for still others, school or college.

The manual has been designed to be flexible in its use and to rely upon the administrator's experience and judgments in applying the tools to examine various planning situations. It is organized into several "modules," each of which addresses a particular aspect of the overall planning and management process within academic units. Each module consists of worksheets for identifying, organizing, and analyzing data, and procedures for helping to investigate a variety of planning and management concerns. The tools and procedures can and should be modified by academic unit administrators to fit their particular situation.

While implementation of this manual can occur at various levels within an institution, it is designed to focus on the academic department. The academic department is typically an organized unit within a school or college dealing with a specific field of knowledge. For example, the English Department typically would be an organized unit within the College of Arts and Sciences; Accounting would be a department within the School of Business; and the Department of Ecology might be an organized unit within the College of Engineering. However, it should be mentioned that, in some cases, a school or college might be equivalent to a department and a division might be analogous to a department. Throughout the manual, "academic unit" will be used as a generic term to denote the user's basic organizational unit.

ACKNOWLEDGMENTS

The development of this document has been significantly aided by several individuals of the higher education community who contributed their time and professional expertise in reviewing our efforts. We offer special thanks to Dr. James S. Dyer of the UCLA Graduate School of Management, Dr. Richard L. Featherstone of the Michigan State University College of Education, Dr. Stephen Hoenack of the University of Minnesota Management Information Services Division, and Dr. Paul Dressel of the Michigan State University Office of Institutional Research who provided technical consultation.

This field review edition, especially, has greatly benefited from the experience and foresight of administrators of Ball State University and the University of Minnesota who gave much of their time and effort to work with the authors in the field development of the earlier version of this document. Their suggestions have been incorporated into this version and have helped to improve this document. We would like to recognize these individuals and offer our gratitude:

Ball State University:

Dr. Richard Burkhardt, Academic Vice-President
Dr. Robert Carmin, Dean of College of Science and Humanities
Mr. Duane Deal, Chairman of Mathematics/Computer Science Department
Dr. Duane Diedtrich, Assistant to the Dean of College of Science and Humanities
Dr. Louis Inglehart, Chairman of Journalism Department
Ms. Kay McNitt, Doctoral Fellow
Dr. Jerry Nisbet, Director of Evaluation
Dr. Norman Norton, Chairman of Biology Department
Dr. Dick Renner, Chairman of English Department
Dr. William Tomlinson, Chairman of Radio/TV Department
Dr. Richard Wires, Chairman of History Department
Dr. Steve Wurster, Assistant to the Academic Vice-President

University of Minnesota:

Dr. Jerry Clausing, Language Coordinator, German Department
Dr. George Copa, Vocational/Technical Education Department
Dr. Stephen Hoenack, Director of Management Information Services Division
Mr. William Weiler, Assistant Director of Management Information Services Division
Dr. James Werntz, Director of the Educational Development Center
Mr. Ronald Zillgitt, Coordinator for Administrative Systems Development, Management Information Division

Similarly, we are very grateful to the following individuals who reviewed the initial draft of the manual and provided constructive comments that guided our subsequent revision efforts:

Dr. Gary Andrew
Director of Planning and Analysis
University of Colorado

Dr. Douglas D. Anton
Dean of General Studies
Trinidad State Junior College

Mr. Morton L. Arkava
Chairman, Department of Social Work
University of Montana

Dr. James H. Beaird
Director, Division of Teaching Research
Oregon State System of Higher Education

Dr. Peggy Conte
Associate Dean
School of Home Economics
Purdue University

Dr. William F. Denman
Vice-President for Student Affairs
University of Arkansas

Dr. Richard L. Harris
Director of Continuing Education
Grays Harbor College

Dr. Paul E. Jedamus
Chairman, Management Science Division
Graduate School of Business and Administration
University of Colorado

Ms. Mary Kinnick
Associate Director
Planning and Institutional Research
Portland State University

Dr. Donald R. Mankenberg
Dean, Occupational Studies
Community College of Denver, North Campus

Dr. Charles O. Neidt
Academic Vice-President
Colorado State University

Dr. Thomas M. Shay
Associate Professor of Higher Education
University of Colorado

Mr. Paul Stephan
Senior Research Associate
Human Services Design Laboratory
Case Western Reserve University

Dr. Sandra A. Warden
Associate Professor
Justin Morrill College
Michigan State University

Dr. Charles Trembly
Chairman, Department of Economics
Community College of Philadelphia

We would like to offer a special thanks to the following staff members: Leonard Romney for all-round help in putting together this document; Dennis Jones and Allan Service for assistance in reviewing and clarifying the overall conceptualization of the manual; Sid Micek for guidance on the Outcomes Module; Doug Collier for help on the Finance Module; and Warren Wolff for his work on the early stages of this document. We also want to thank the staff members who have reviewed and contributed suggestions for improving the document: Robert Wallhaus, Robert Huff, Wayne Kirschling, James Topping, Nancy Renkiewicz, Charles Manning, Maureen Byers, and Mike Haight. Lorraine Hori and Barbara Baker are singled out for providing countless hours of administrative assistance, with patience.

TABLE OF CONTENTS

LIST OF SAMPLE WORKSHEETS

LIST OF FIGURES

AN OVERVIEW OF THE MANUAL

Introduction

Academic units (school/college/division/department) are the basic organizational units within which the educational activities of an institution happen, where critical resources are assigned, and where many of the needs and interests of personnel are dealt with. Furthermore, while the academic unit administrator is faced with handling the multiplicity of demands of faculty, students, institutional administrators, the legislature, and donors (Brann, 1972; Dressel, Johnson, Marcus, 1970), the administrator's role also includes the task of resource allocation.

Regarding this task, the academic unit administrator is in a position similar to other levels of administrators who have been provided scarce resources. It was possible to some extent in the 1950s and 1960s to honor most proposals for additional funds. However, today difficult choices must be made and relative values placed on alternative uses of resources (Hoenack, et al., 1974). Moreover, administrators are recognizing more than ever the need to investigate the planning and management options available to their organizational unit as well as the degrees of flexibility available to pursue these different options. In effect, the needs of the academic unit must be made more visible, its productivity justified, and its resources negotiated. As a result, planning and management at this academic unit level is a primary concern if the institution as a whole is to operate efficiently and effectively.

This concern can be addressed by developing a capability to (1) identify and analyze the functions, demands, resources, and outcomes of an academic unit and (2) communicate information about these aspects of the academic unit to the decision makers involved. From this kind of information-based approach, greater understanding might be reached regarding the level (and type) of decisions that are to be made in the department (Featherstone, 1972), those that are made or influenced by other levels of administration, and those that are made jointly by the department and other levels of administration.

This manual has been designed to improve planning and management at the academic unit level within an institution by providing capabilities and procedures to obtain and communicate more definitive information about the unit's functions, demands, resources, and outcomes and to focus on some key planning and management concerns/problem areas that pertain to the unit.

It is recognized that academic unit planning and management in many institutions is highly dependent upon its interrelationships with other levels of administration. While an attempt to describe explicitly these interrelationships is not made in this document, this manual has been prepared with those interrelationships in mind. An attempt is made to examine the internal operations of an institution from the perspective of academic unit administrators who are at the vantage point where program operations are executed. In this respect, academic unit planning and management may provide information that can be used toward the planning and management of the overall institution.

Also, planning and management incentives must be identified and provided in order for administrators to find better ways to allocate resources, to conduct activities, and to attain objectives. If the department does not have a role as a functioning element in the total institutional organization, it is a waste of time talking about how to be a more efficient administrator (Key, 1970). Moreover, the administrator must be cognizant of the responsibility for making and implementing decisions that impact the academic unit as well as the institution.

How an Academic Unit Functions

One view of how an academic unit functions is shown in Figure 1. The perspective is founded on the rationale that a viable way to manage the academic unit is through planning and managing the specific aspects of the unit's operation, namely its functions, demands, resources, and outcomes. In addition, the figure shows the societal and institutional guidelines and constraints that impact on the entire process. The idea is to improve decision making through a better understanding of these aspects and their interrelationships.

FIGURE 1

ACADEMIC UNIT PLANNING AND MANAGEMENT PROCESS

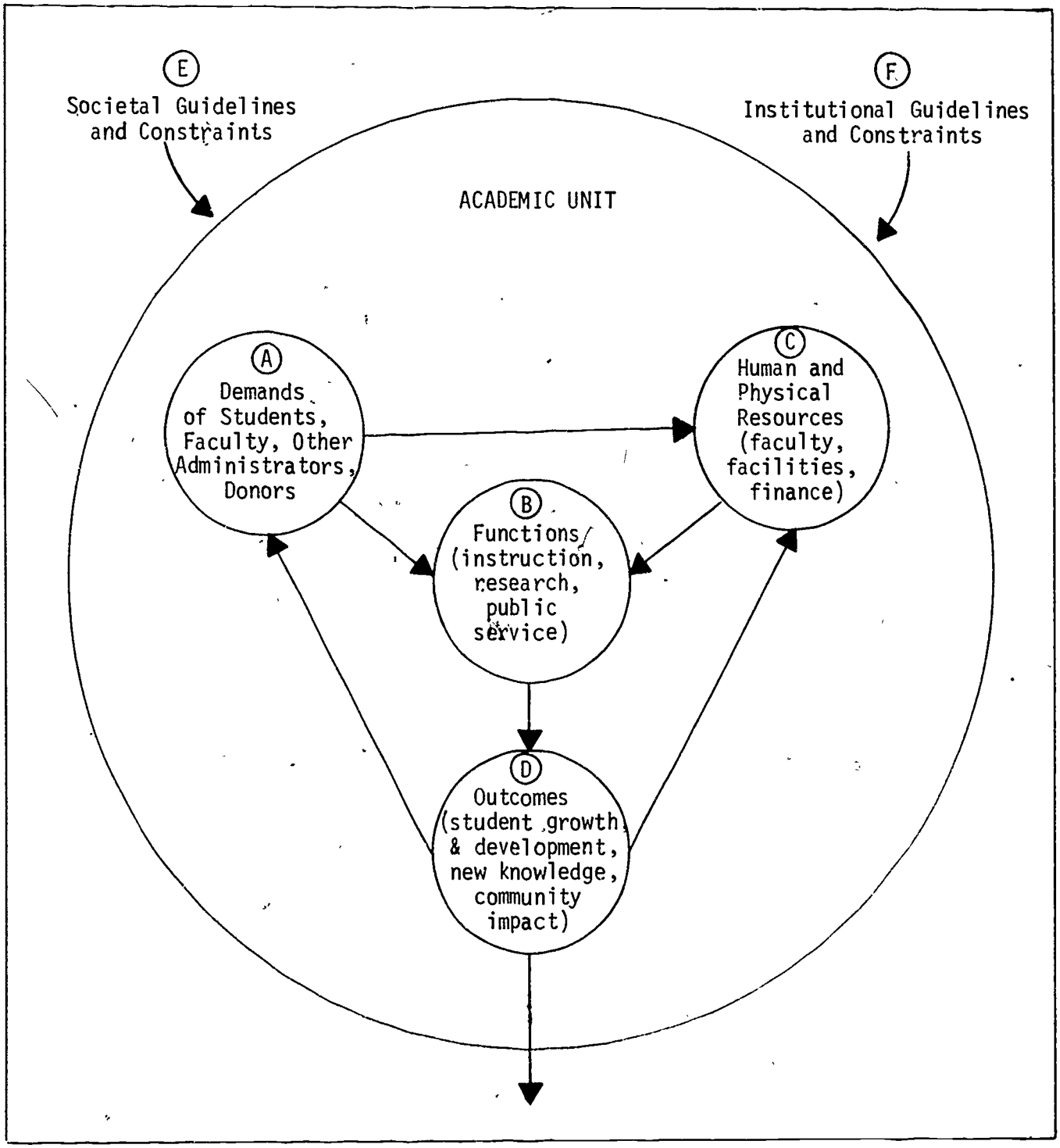


Figure 1 is explained in the following paragraphs:

(A) Demands of Students, Faculty, Other Administrators, Donors.

The demands and interests of students, faculty, research agencies, other administrators, community groups, donors, and other constituents give rise to needs for certain functions and resources for carrying out those functions.

(B) Functions.

These functions are such things as teaching courses, conducting research, counseling and advising students, presenting public seminars, professional development, and committee work. Within these functions, various educational activities are conducted to produce outcomes.

(C) Human and Physical Resources.

Also, resources, in the form of funds, faculty and staff, facilities, equipment, supplies, and services are needed to support these functions.

(D) Outcomes.

As a result of carrying out the academic unit's functions with the resources provided, various outcomes occur. These could be such things as student growth and development, discovery and dissemination of new knowledge, or services to the general public and specific community groups. In many cases, these outcomes pertain to the degree that the demands of the various constituents were satisfied (as depicted in Figure 1 by the arrow feeding back to (A)).

In addition, the extent to which the resources were utilized or consumed are outcomes in their own right. This information, fedback to the inventory of human and physical resources ((C)), can provide a basis for planning in the next academic period.

(E) and (F) Societal and Institutional Guidelines and Constraints. Finally, an academic unit is always influenced, in varying degrees, by guidelines and constraints stemming from institutional policies and societal expectations. Thus, as a part of the institutional system, which in itself is a segment of the societal environment, the academic unit administrator must be cognizant of and respond to the external as well as internal forces that impact the unit's operation. These guidelines and constraints often shape (or even predetermine) many of the academic unit's objectives and outcomes, and thus, its functions.

Underlying the process shown in Figure 1 are various concerns/problem areas that are faced by academic unit administrators. Although administrative styles and organizational structures vary among academic units, planning and management concerns common to many units can be identified. Some of these are:

Determination of Academic Unit Functions and Activities

Determining the specific activities to be conducted by the unit for carrying out the functions of teaching, research, public service, and others, the choices of which are influenced by such factors as degree

program requirements, size of budget, faculty availability, institutional and academic policies, educational development and innovations, and educational objectives being pursued.

Determination of Academic Demand

Examining student demand as a means to plan the appropriate curriculum for meeting degree program requirements and other academic demands such as thesis advising, committee work, and research in order to determine the load created by academic demand.

Interdepartmental Relationships

Identifying interdepartmental relationships since: students induce course load requirements (service loads) on several departments; faculty may be assigned to teach in other units; departments share classrooms and laboratories; and interdisciplinary programs require support from several discipline specialties.

Resource Availability, Assignment, and Utilization

Assessing the resources available and assigning them to functions. For example, planning the best possible assignments of faculty resources or assessing the availabilities of facilities to conduct various functions and activities. In addition, monitoring the uses of resources such as the funds provided to the unit. Where are funds being spent? If a research grant were to end, what functions and areas of funding will be affected? Also, monitoring the utilization of facilities, equipment, supplies, and services provided to the unit.

Responding to Changes

Examining and responding to changes in functions that cause resources to be reallocated. For example, a research commitment accepted at the last minute usually incurs changes in teaching assignments.

Outcomes Assessment

Assessing the outcomes produced by the unit and the extent to which the demands of donors, students, faculty, and the institution were met.

Development of Plans and Budgets

Formulating the unit's plans and budgets for submission to the institutional office. Furthermore, negotiating as well as communicating the contents of the plans and budgets.

Administrative Coordination

Keeping abreast of administrative matters, for example, the administrative routine of the institution, departmental meetings, graduate student selection, and supervision of staff personnel.

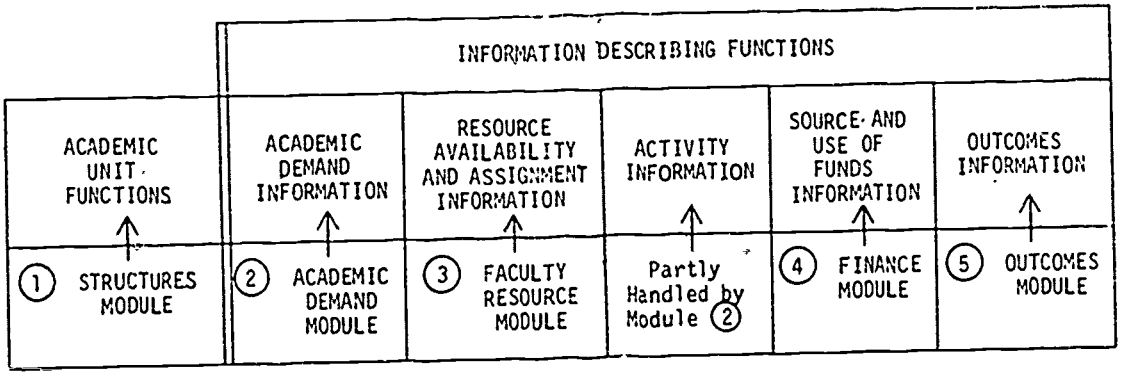
Organization of the Manual

The worksheets and procedures contained in this manual are organized according to "modules," each of which focuses on a concern/problem area mentioned above. Naturally, it would be a difficult task to include all concerns, so some are not addressed. Those that are addressed pertain closely to the aspects of the academic unit's operation described in Figure 1. Thus, by using

a particular module, the administrator can investigate a specific area of concern and obtain information for planning and management purposes. Figure 2 below relates each module to the kind of information it provides. It is suggested that Module 1 (Structures Module) be used first to identify the academic unit's functions. Subsequently, Modules 2-5 can be used to obtain and analyze information related to the various dimensions of those functions.

FIGURE 2

ORGANIZATION OF THE MODULES



Module 1: Identifying and Organizing Academic Unit Functions

This module helps to identify and determine a unit's functions. It provides procedures for organizing the functions according to the major programs of an institution. A discussion of how the structure can be used during different planning and management stages (planning, budgeting, execution) is provided also.

Module 2: Examining Academic Demand

This module provides an approach for ascertaining how much effort has to be directed to each of the academic unit's functions or what level of activity is required to carry out a function. Primary attention is devoted to estimating total course enrollments and the number of sections to offer for each course. Concepts of the Instructional Workload Matrix and Induced Course Load Matrix also are provided as a means to help analyze the number of students from other academic units being served by the particular academic unit.

Module 3: Planning Faculty Resources

In this module, worksheets and procedures are provided to investigate faculty availabilities and assignments to the unit's functions. The module focuses on the use of information about faculty capabilities and interests to facilitate the assignment process.

Module 4: Planning Financial Resources

This module provides a means to examine the sources and uses of a unit's funds. It can be used to identify the functions that expend those funds and the areas in which funds are needed in order to meet the unit's objectives.

Module 5: Identifying and Assessing Outcomes

This module provides an approach for identifying how well the objectives of a particular function were accomplished. An exemplary inventory of outcome measures and an introduction of a method for translating objectives into measurable outcomes are provided as aids. A method for comparing actual against planned outcomes is provided also.

Although the modules are interrelated, the administrator has the option to determine which module(s) to use in addressing the unit's areas of concern. Some may use only one module to address a particular area, such as examining student demand, or some may use various combinations of the modules to obtain a more comprehensive picture of the planning needs of the unit, for example, the interrelationships among faculty allocation, the distribution of funds across the functions to be carried out, and the outcomes to be achieved.

In using this manual, several major considerations should be noted by the user. One consideration is the need to identify the sources from which specific data items can be obtained. For example, the administrator will need to know from where and whom to obtain student data, faculty data, inventories of supplies and services, status and availability of equipment, list of rooms available for use, and so forth. In many cases, an institutional level office will have these data available. However, there also may be instances where the academic unit must turn to its own data files (if they exist) or start developing its own data inventories.

Another consideration is that costing is done typically at the institutional level and provided to academic units; therefore, procedures for costing within academic units are not covered in this manual. Academic units interested in costing programs should refer to the following NCHEMS publications: Cost Analysis Manual (Topping, 1974) and Information Exchange Procedures: Cost Study Procedures (Johnson and Huff, 1975).

Also, the allocation and analysis of facilities, equipment, supplies, and services have been intentionally omitted in this manual. These physical resources usually are managed from a central pool in lump sum and therefore their allocation to specific activities may not be as meaningful to academic unit administrators as some of the other areas covered in this manual.

Finally, the planning manual consists of concepts integrated from other NCHEMS products. In implementing this manual, the user may wish to turn to these other NCHEMS documents for more detailed explanations. A listing of these products and their contributions can be found in Appendix A.

MODULE 1

IDENTIFYING AND ORGANIZING INFORMATION ABOUT ACADEMIC UNIT FUNCTIONS
((1) STRUCTURES MODULE)

Introduction

The academic unit conducts a whole host of activities and functions to meet the demands and expectations of students, faculty, institutional administrators, and societal constituents. In addition, these activities and functions are influenced typically by institutional and societal guidelines and constraints. As a result, the first step in the planning and management of an academic unit is to sort out and gain an understanding of the full array of functions to be performed by the unit (Dressel, et al., 1970). While many of the functions of an academic unit are in response to student needs (courses, thesis advising, student counseling), some are in response to commitments to external funders (research), some are in response to institutional commitments (committee work, public appearances), and still others are in response to academic unit operating procedures (academic advising, faculty recruitment, personnel development).

Furthermore, the planning and management of these functions should be based on information obtained systematically rather than simply on intuition, tradition, or whatever. From the standpoint of the academic unit, particularly important are information about the level of activity in each function; faculty availabilities and workload assignments; the availability and allocation of physical and financial resources, and how well the unit planned and

met the objectives of the functions. Moreover, this information is better understood and communicated (and therefore of more potential use) if it is organized in some coherent and consistent fashion, that is, if it is structured. And for the purposes of the academic unit, although information could be organized around several different dimensions, that structure can be usefully built around the unit's functions. Thus, it is a crucial task for the academic unit administrator to consider and determine the kinds and scope of functions to be carried out within the unit.

The purpose of this module is to help ensure that the list of functions to be carried out by the unit is as complete as possible, keeping in mind the guidelines, constraints, demands, and expectations of the unit's participants and constituents. The worksheets and procedures provided in this module are to assist in:

- Identifying the full array of the unit's functions and organizing them for analysis and communication purposes.

- Identifying and organizing the kinds of information (measures) that can describe a function for planning and management purposes.

- Learning how to use the structure and its measures during the planning and management phases (planning, budgeting, and execution) of the academic unit.

Worksheets Provided

This module contains two worksheets shown in blank form on the next two pages. Samples of these worksheets that are illustrated with hypothetical data are shown later in this module. The worksheets are:

Worksheet 1A: List of Academic Unit Functions

This worksheet can be used to record and organize the various functions of the academic unit.

Worksheet 1B: Information Summary

This worksheet can be used to identify and organize the various measures that would describe the functions of the unit.

Procedures for Identifying and Organizing the Unit's Functions

The following procedures assist in identifying and organizing the functions of an academic unit. In many cases, an institution may request that its academic units align their functions with the institution's programs. Therefore, the academic unit would best develop a structure that would be compatible with the institution's structure and programs.

STEP 1

Determine the specific functions to be carried out within the academic unit during the academic term being planned. These functions are such things as the courses to be offered, research projects, public service events, committee work,

WORKSHEET 1A

LIST OF ACADEMIC UNIT FUNCTIONS Academic Term:	
ACADEMIC UNIT FUNCTIONS	Institutional Programs

WORKSHEET 1B

INFORMATION SUMMARY

FUNCTION:

ACADEMIC TERM: INDIVIDUAL RESPONSIBLE:

(a) Information Measure	(b) Descriptors	(c) Planned Measure	(d) Budgeted Measure	(e) Actual Measure

student advising and counseling, and professional development. Try to make this list as complete as possible. Input regarding these functions might be obtained from faculty who have commitments, past instructional offerings, interdepartmental commitments, institutional policies, and an analysis of student needs.

STEP 2

Using the left column of Worksheet 1A, organize the list of functions according to institutional programs. List the institutional programs in the right column. Typically, functions with similar objectives or primary intent can be readily identified, grouped together, and related to a program. (For those interested in reviewing a framework that consists of a comprehensive array of typical institutional programs, Appendix B briefly describes the NCHEMS Program Classification Structure (PCS) that organizes activities in a program-oriented manner). A sample Worksheet 1A on the next two pages illustrates this relationship.

STEP 3

The completed Worksheet 1A contains in organized fashion the list of things that need to be done within the academic unit. However, as more current information is received regarding these functions, the administrator can update the completed Worksheet 1A by reflecting any modifications, additions, and deletions. The Worksheet 1A now reflects the most current picture of the unit's functions.

HE 006 523

This document is intended to provide a systematic aid for palnning and managing academic units (schools, colleges, departments, or divisions) within an institution. It consists of a comprehensive set of techniques and procedures that can be used [redacted] by academic unit administrators to examine the internal operations of their units--their functions, demands, faculty and financial resources, and outcomes. While implementation of this manual can occurx at various levels within an xx institution, it is designed to focus on the academic departments. The document xx has been designed to be flexible in its use and to rely upon the administrator's experience and judgements in applying the tools to examine various planning situations. It is organized into several "modules," each of which addresses a particular aspect of the overall planning and management process within academic units. Modules are: (1) structures module; (2) academic demand module; (3) faculty planning module; (4) finance module; (5) outcomes module. Appendixes describe: (1) contributions on NCHEMS products to the academic unit planning xxxx manual; (2) the NCHEMS program classification structure; (3) program measures; (4) completion of worksheet 3B, the faculty planning form; (5) inventory of higher education outcomes variables and measures. (Author/KE)

*Higher Education; *Educational Planning; *Management Information System; *Unit Plan; *Module Building Design; Departments; Planning; Management Systems; Systems Approach

WORKSHEET 1A (SAMPLE)

LIST OF ACADEMIC UNIT FUNCTIONS

Academic Term: *Fall 1975*

HISTORY DEPARTMENT FUNCTIONS	Institutional Programs
Hist 100	*Instruction*
Hist 200	
Hist 350	
Hist 500	
Hist 530	
.	
.	
.	
Hist 610	
Hist 625	
.	
.	
.	
Department Research	
Thesis Advising	
Student Course Counseling	
.	
.	
.	
Research Project 1	*Research*
Research Project 2	
Research Project 3	
Research Proposal Development	
.	
.	
.	
Historian's Conference	*Public Service*
Consulting for Nonprofit Agencies	
.	
.	
.	

LIST OF ACADEMIC UNIT FUNCTIONS

Academic Term: *Fall 1975*

HISTORY DEPARTMENT FUNCTIONS	Institutional Programs
History Library	*Academic Support*
Administrative Duties	
Curriculum Development	
Faculty Recruitment & Evaluation	
.	
.	
.	
Closed-Circuit TV Operation	
Audiovisual Services	
.	
.	
.	
Student Organizations	*Student Service*
Tutorials	
Personnel Counseling	
Scholarships, Grants, and Loans	
.	
.	
.	
Institutional Committee work	*Institutional Support*
Alumni Fund Raising	
Community Relations	

NOTE: Often, the academic unit may wish to organize the functions according to its own programs first before organizing them by institutional programs. In this case, an intermediate step can be taken as shown in the illustration below.

For example, the History Department may organize the functions along the department's programs which in turn are grouped and related to the institution's programs:

History Department Functions	History Department Programs	Institutional Programs
Hist 100 Hist 200 Hist 350 . . .	Undergraduate Instruction	Instruction
Hist 610 Hist 625 . . .	Graduate Instruction	
Research Project 1 Research Project 2 . . .	Individual Research	Research
Research Proposal Development Research Seminars	Other Research	
		. . .
History Library Curriculum Development Faculty Recruitment & Evaluation . . .	Academic Services	Academic Support
Administrative Duties Department Committee work . . .	Departmental Administration	
Closed-Circuit TV Operation Audiovisual Services . . .	Technical Support . . .	. . .
Etc.	Etc.	Etc.

Procedures for Identifying Information to Describe a Function

As mentioned earlier, identifying the full array of functions is just the first step. In order to assist in the planning and management of an academic unit, additional items of information called "measures" are needed to describe or tell something about each function of the structure -- How much of each function? What resources are available for performance? How well were these functions performed? For example, just knowing that the unit intends to offer History 100 is not a sufficient basis for planning and management. Additional information about the course must be identified: the number of enrollments, the faculty assigned to teach the course, the method of teaching, the number and percent of completers, the number and kind of sections to offer, and so forth. Figure 3 illustrates this relationship between a function of the structure and the information associated with it.

FIGURE 3

A FUNCTION AND ITS INFORMATION MEASURES (EXAMPLE)

(Structure)	ITEMS OF INFORMATION (Measures)							
Academic Unit Function	Demand Information	Resource Information		Activity Information		Financial Information		Outcomes Information
		Availability	Allocation	Type	Level	Source	Amount	
History 100	*300 Fr.*	*Faculty: 2 Full Prof. 4 Assoc. Prof. 6 Asst. Prof. 5 TA's*	*Faculty: 1 Full Prof. 3 Assoc. Prof. 2 Asst. Prof.*	*Lecture*	*6 Sec.*	*Account X*	*$10,000*	*% Completers Student Evaluation of Instructor*
			Faculty: 3 Assoc. Prof. 4 Asst. Prof. 5 TA's	*Recitation*	*12 Sec.*	*Account X and Y*	*$15,000*	*% Attendance Student Evaluation of Instructor*
		Facility: Rooms 305, 306, 308, 312, 314, 322	*Facility: Rooms 305, 308, 312, 322*	*Classroom Use: 305, 308, 312, 322*	*MWF, 9:10 MWF, 9:10 MWF, 11:10, 12:10 TTh, 8:10, 9:10, 2:10*	-	-	-

The following procedures can help the administrator to identify the kinds of information to associate with a function.

STEP 1 Refer to the list of unit functions and select those to be examined in more depth. These might be functions in greater demand, or those for which more detailed information is needed for planning purposes. Establish a Worksheet 1B (blank form) for each of those selected.

STEP 2 For each function, determine the appropriate information measures categories that will be used to describe the function and record them in column (a) of the worksheet (for examples, refer to the sample Worksheet 1B on the next two pages). How the unit selects these categories must be decided by the user. For example, in Worksheet 1B (Sample 1), the measures categories of faculty, facility, equipment, supplies, and services are used to describe the Resources related to History 100. (For those interested, Appendix C provides a brief description of the NCHEMS Program Measures framework that identifies categories of information describing PCS program elements).

STEP 3 For each category the unit has decided upon, identify the descriptors that will be used to describe quantitatively or qualitatively each measure category and record them in

WORKSHEET 1B-SAMPLE 1

INFORMATION SUMMARY

FUNCTION: *History 100*

ACADEMIC TERM: *Fall 1975*

INDIVIDUAL RESPONSIBLE: *Prof. Jane Door*

(a) Information Measures	(b) Descriptors *	(c) Planned Measures	(d) Budgeted Measures	(e) Actual Measures
Demand				
-Student	*Numbers and Student Level; Percentage and Level; Percentage of Majors*	*300 Undergraduates; 100% Freshmen; 75% Majors*	*300 Undergraduates; 75% Freshmen/25% Soph; 90% Majors*	*282 Undergraduates; 80% Freshmen/20% Soph; 85% Majors*
Resource				
-Faculty	*Name; Rank*	*1 Full Prof., 3 Assoc. Prof., 2 Asst. Prof.*	*2 Full Prof., 3 Assoc. Prof., 1 Asst. Prof.*	*Door, Wong, Narr, Crow, Santos, White*
	Percent Assignment; Contact Hours; FTE Assignment	*3 Weekly Contact Hours/Faculty*	*3 Weekly Contact Hours/Faculty*	*3 Weekly Contact Hours/Faculty*
-Facility	*Type; Room*	*Classrooms: H305, H308, H312, H322*	*H305, H308, H312, H322*	*H305, H308, H312, H322*
	Number of Stations; Assign. Sq. Ft.	*At Least 50 Each*	*At Least 50 Each*	*At Least 50 Each*
	Hours per Week	*Mornings; 3 Hours/ Week*	*H305: MWF, 9:10 H308: MWF, 9:10 H312: MWF, 11:10 H322: TTh, 8:10*	*H305: MWF, 9:10 H308: MWF, 9:10 H312: MWF, 11:10 H322: TTh, 8:10*
-Equipment	*Type; Number of Items*	-	-	-
	Percentage Utilization; Amount			
-Supplies	*Type; Amount*	*Office; $100*	*Office; $100*	*Office; $100*
-Service	*Type*	-	-	-
	Percent Utilization; Actual Usage Cost			
Activity				
-Mode of Instruction	*Type*	*Lecture*	*Lecture*	*Lecture*
-Sections	*Number*	*6*	*6*	*6*
-Course Credit Hours	*Number*	*3*	*3*	*3*
-Section Size	*Number*	*50*	*50*	*47*
-Contact Hours	*Number*	*3*	*3*	*3*
Financial				
-Salaries	*Dollars*	*10,000*	*10,000*	*10,000*
-Equipment	*Dollars*	-	-	-
-Supplies	*Dollars*	*100*	*100*	*100*
-Services	*Dollars*	*0*	*0*	*0*
Outcomes				
-Course Completions	*Number; Percentage Completion*	*270; 90%*	-	*248; 88%*
-Course Evaluation	*Degree of Satisfaction with Course*	*Student Evaluation will Reflect Above Average Satisfaction*	-	*Student Evaluation Reflected Highest Degree of Satisfaction*

*Measures may not be available for some of the descriptors illustrated here.

WORKSHEET 1B-SAMPLE 2

INFORMATION SUMMARY

FUNCTION: *Research Project #12345*

ACADEMIC TERM: *Fall 1975* INDIVIDUAL RESPONSIBLE: *Prof. Lin Wong*

(a) Information Measures	(b) Descriptors	(c) Planned Measures	(d) Budgeted Measures	(e) Actual Measures
Demand				
-Faculty Time	*FTE; Person*	*.5; Wong*	*.5; Wong*	*.5; Wong*
Resource				
-Faculty	*% Assignment*	*50%*	*50%*	*50%*
-Facility	*Type; Room; Room Use*	*None*	*None*	*None*
-Equipment	*Type; % Utilization*	*None*	*None*	*None*
-Supplies	*Type; Amount*	*Office; $300*	*Office; $300*	*Office; $300*
Activity				
-Mode of Research	*Type; Proportion of Time Spent*	*Field Research 75%; Literature Research 25%*	*Field Research 75%; Literature Research 25%*	*Field Research 80%; Literature Research 20%*
-Student Participants	*Level: Number; Total Hours*	*Upper Division; 50; 150 Hours*	*Upper Division; 50; 150 Hours*	*Upper Division; 50; 180 Hours*
Finances				
-Salaries	*Dollars*	*12,000*	*12,000*	*12,000*
-Equipment	*Dollars*	*200*	*-*	*-*
-Supplies	*Dollars*	*300*	*500*	*325*
-Services	*Dollars*	*200*	*-*	*-*
-Miscellaneous	*Dollars*	*100*	*300*	*475*
Outcomes				
-Time Spent	*No. of Wkly Hours*	*20 Hours*	*20 Hours*	*24 Hours*
-Research Document	*Title; Date of Completion*	*History of State Governments; March 1976*		*The Historical Significance of State Government: March 1976*

column (b) of each function's Worksheet 1B (blank form). The worksheets now are ready for planning and management uses. [Columns (c), (d), and (e) will be explained later.]

Using Worksheet 1B: Information Summary

Worksheet 1B: Information Summary can be used as a vehicle for communicating and analyzing information about the unit's functions during the planning, budgeting, and execution phases. (The planning phase is concerned with the specification of the desired resources, activities, and outcomes of functions; the budgeting phase is concerned with the allocation of resources, expected activities, and expected outcomes of functions; and the execution phase is concerned with the assignment and actual use of resources, activities conducted, and outcomes achieved.) These distinctions are important because information about a function typically would be different during each phase. For example, during the planning phase, information about the number of students planning to take History 100 might be known; during the budgeting phase, the number of students expected to enroll in the course might be known; and in the execution phase, the students who actually enrolled and who completed the course would be reflected.

Referring back to the sample Worksheets 1B found on pages 29 and 30, note that the worksheets contain columns (c), (d), and (e) for recording at the appropriate point in time information pertaining to the planned (Planned Measures), budgeted (Budgeted Measures), and execution phases (Actual Measures). During the unit's planning phase, the administrator can specify as a first

cut the planned measures for a particular function and record these on a Worksheet 1B. Usually, the information can be derived by the administrator and the individual responsible for the function or by committee. Then, during the budgeting phase when budgets are more or less finalized, the worksheet can be used to record the budgeted measures. Often, due to the need to examine budget tradeoffs among all of the units within an institution, what was planned may not necessarily be what was budgeted. These budgeted measures could be communicated to the individuals responsible for the functions such that they will have a common understanding of the expectations of a specific function.

Finally, during or after execution, the worksheet can be used to record the actual measures. In this way, the worksheet can serve as a communication vehicle between the administrator and the individuals responsible for the functions. Differences or similarities between budgeted and actual measures can be analyzed and a basis be established for making necessary changes in functions for the next planning period.

In short, identifying the unit's functions and obtaining information about the demands, resources, and outcomes during the planning, budgeting, and execution phases can help to describe the choices for fostering and supporting more informed decisions within the academic unit. While this module has laid out a framework for organizing information around a unit's functions, the subsequent modules (Modules 2-5) in this document are designed to assist in obtaining the various measures for helping to plan academic demand, faculty and financial resources, and the goals and outcomes of the academic unit.

MODULE 2

EXAMINING ACADEMIC DEMAND

((2) ACADEMIC DEMAND MODULE)

Introduction

In determining a unit's functions, the administrator needs to identify how large a load or what level of activity will be required for each of the functions. Many of these demands occur not only in instructional courses but in other functions as well. For example, graduate students expect thesis advising from faculty; the institution turns to many faculty members to serve on institutional committees; and, the community expects the staging of cultural events for the public's interest. Thus, by accurately gauging the demand for each function, resources can be allocated or budgeted more efficiently, the types and levels of activity to conduct for each function can be more clearly defined, and the objectives and outcomes of each function can be more definitively ascertained.

A key factor in examining academic demand is the capability to estimate the number of students expected to enroll not only in the institution but also in programs and academic units. Many experienced administrators pride themselves on being able to make sound decisions in this area intuitively. However, "as more and more students drop in and out of the educational process, the likelihood of a decline in stability of enrollments and a corresponding increase in the complexity of forecasts used to project enrollments" (Huckfeldt, 1972:15) may make intuitive judgments progressively

less reliable. In addition, as the demand for learning experiences changes, there is a need to examine in more detail the relative shifts in student demand among the institution's academic units. While an administrator at central office may be able to predict enrollments quite accurately due to an averaging process, this would not be as appropriate at the academic unit level. In fact, it may be more meaningful for institutional and academic unit administrators to determine the estimates of student demand jointly.

But, similarly, there are other demands that need to be met as well by the academic unit. In investigating other academic demands, the administrator would be interested in questions such as:

1. What research commitments do faculty have that will influence the amount of time available for teaching?

2. How many doctoral and Master's degree students need to be advised for dissertation and thesis work?

3. How much time and effort is needed to serve on the Faculty Senate Policy Committee, that is, how many meetings are to be held this term, and how often and how much work is involved outside of the meetings?

The purpose of this module is to provide worksheets and procedures for assisting with the examination of academic demand with primary focus on student demand for the unit's courses.

Examining Student Demand at the Institutional Level

While a multitude of approaches and mechanisms are used to obtain student enrollment estimates, such as regression models, student flow models, pooled judgment models (Wing, 1974), one of the most widely used ways to examine student demand on an institution-wide basis is with a display called the Instructional Work Load Matrix (IWLM). This display is constructed from the student registration data of the institution and shows the total number of units (credit or contact hours) taken by all students in a given degree or certificate program from each of the departments or disciplines of the institution during a specified time period. Figures 4 and 5 (Haight and Manning, 1972) serve to illustrate the IWLM concept.

FIGURE 4

EXAMPLE OF AN IWLM

		Major A	Major B	Major C
Department	1	315	430	285
	2	210	560	360
	3	265	340	465

The IWLM above illustrates that all students of Major A took 315 (credit or contact hours) from Department 1, 210 from Department 2, 265 from Department 3, and so forth.

From an IWLM, an Induced Course Load Matrix (ICLM) can be calculated that displays the average number of units (credit hours) that students in various degree or certificate programs take in each department or discipline during a specified time period. The ICLM is produced by dividing the enrollment (headcount or institutionally defined FTE) of each major into the total hours (displayed by the IWLM) that all students of a given major take in each department (see Figure 5 below).

FIGURE 5
DERIVATION OF THE ICLM FROM THE IWLM

Department	Major A	Major B	Major C	
1	315	430	285	IWLM (in credit hours)
2	210	560	360	
3	265	340	465	
	÷	÷	÷	÷
	50	100	75	Enrollment (in headcount)
	=	=	=	=
Department	Major A	Major B	Major C	
1	6.3	4.3	3.8	ICLM (in credit hours)
2	4.2	5.5	4.8	
3	5.3	3.4	6.2	

The ICLM above illustrates that on the average, the typical student in Major A takes 6.3 credit hours in Department 1, 4.2 in Department 2, 5.3 in Department 3, and so forth.

Although shown in two dimensions, both an IWLM and ICLM can be expanded from two to four dimensions by adding student levels (lower division, upper division, graduate) within majors and course levels (lower division, upper division, graduate) within departments. From a technical standpoint, this expansion should readily be possible since the capability usually is included in the computerized procedures.

In effect, the ICLM and IWLM are used at the institutional level to provide information about the departments or disciplines in which students of each major or field of study take course work (consumption information) and the flow of student units (credit hours, contact hours, headcount) from instructional disciplines to the various majors or fields of study (contribution information). In short, the contribution information focuses on the individual disciplines or departments and shows which majors or student programs they serve.

NCHEMS has a software package called the Student Data Module (Haight and Martin, 1975) that is capable of assisting users to obtain consumption and contribution information about student demand by developing an institutional IWLM and ICLM.

Examining Student Demand at the Academic Unit Level

One of the first estimates of student demand for a unit's courses can be obtained from the institution's IWLM, especially if the IWLM data can be provided at a level of detail appropriate for use by the unit administrator.

For example, Figure 6 illustrates student demand information of interest to a department administrator that has been obtained from the institutional IWLM:

FIGURE 6

DEMAND FOR A DEPARTMENT'S COURSES, BASED ON THE INSTITUTIONAL IWLM

Major

Dept.	A	B	C
1	105	143	95
2	70	186	120
3	82	113	155

Institution's IWLM (Headcount Enrollments)

[Dimensions have been expanded to include major, by student level, and the specific courses of Dept. 3.]

Major

Student Level

Dept. 3	A		B		C	
	LD	UD	LD	UD	LD	UD
Course 101	10	2	50	5		
Course 150	12	3				
Course 202	35	12	15		10	75
Etc.						

Dept. 3's IWLM (Headcount Enrollments)

Thus, Figure 6 shows that out of 82 headcount students of Major A taking courses in Department 3, 10 are lower division headcount enrollments served by Course 101, 12 by Course 150, and so forth.

The student demand information can help the administrator to answer several key questions at this level of planning:

1. What student majors are expected to take courses in the department?

2. How many headcount enrollments would these majors generate in the department and in which courses?

3. Which courses are more service-oriented than others?

4. Is the pattern of courses taken in the past by these majors stable?

Furthermore, once the probable demand for courses is known, enrollment data and decision rules on section sizes can be used to ascertain the number of course sections that a unit is capable of offering. Thus, from the unit administrator's viewpoint, the examination of student demand is an effort that requires the unit's assessment of its expected enrollments as well as information about student registrations. Often as a first start, the institutional IWLM will have the appropriate data; however, if not, then it usually will be necessary to translate the IWLM data into the level of detail appropriate for the unit administrator, or reports specifically for the unit administrator will need to be generated separately from student registration files.

Note that while the total demand for a given course is typically the item of most interest to an academic unit administrator, an awareness is increasing regarding the "servicing" function of the academic unit, that is, what students other than the unit's own majors is the unit serving? Because of this awareness, an examination of the mix of majors in a course, by level, is becoming a topic of growing interest today.

Worksheets Provided

This module contains several worksheets (blank forms are shown on the next three pages) that can assist the administrator in examining academic demand. Most administrators account for the unit's demand by some method; however, the worksheets and procedures in this module have been provided as another possible approach to assessing the unit's student demands.

Worksheet 2A: Patterns in Course Enrollments

This worksheet can be used to display previous course enrollments and therefore provide information regarding any trends (upward, downward, no change) in enrollment patterns. The level of detail can be determined by the administrator.

Worksheet 2B: Expected Course Enrollments

This worksheet is in two parts. Part 1 can be thought of as the unit's IWLM that displays headcount enrollments of students by major and level for each of the courses offered by the academic unit. Part 2 helps to estimate the number of sections to offer for each course based on the headcount enrollment determined in Part 1.

WORKSHEET 2A

PATTERNS IN COURSE ENROLLMENTS

Academic Period: _____

Date: _____

(a) Courses	(b) Course Category (Level)	(c) Academic Period (d) Majors	Nonmajors	Total	Majors	Nonmajors	Total	Majors	Nonmajors	Total	Majors	Nonmajors	Total	Majors	Nonmajors	Total	(e) Projected Majors	Nonmajors	Total

WORKSHEET 2B

EXPECTED COURSE ENROLLMENTS

Planning Period: _____

Date _____

PART 1: UNIT IWLM

PART 2: CALCULATING THE NUMBER OF SECTIONS

(a) Courses	(b) Course Category (Level)	(c) Student Major	(d) Student Identifier (Level)	(e) Expected Enrollment of Majors	(f) Total Course Enrollments: Own Majors	Others	Total	(h) Desired Section Size	(i) Number of Sections Required	(j) Number of Sections Planned: Required	Additional
(g) Total Headcount Enrollments											

WORKSHEET 2C

OTHER ACADEMIC DEMAND

Planning Period: _____

Date: _____

Noninstructional Functions	(a) Demand	(b) Faculty/ Staff Involved	(c) Expected FTE Assignment	(d) Sponsoring Agency	(e) Agency Contact	(f) Project Funding $	(g) Duration		(h) Outcomes/ Products Desired	(i) Comments
							Start	End		

Worksheet 2C: Other Academic Demand

This worksheet can be used to record demands arising in research, public service, student advising, and other noninstructional functions.

Procedures for Examining Course Enrollment Patterns

The academic unit administrator will undoubtedly want to know previous enrollment patterns for the courses to be offered. Often, by looking at aggregate enrollments, the administrator can obtain a "feel" for shifts in course enrollments. The following procedures used with Worksheet 2A provide a general approach for examining enrollment patterns.

STEP 1 Using a blank form of Worksheet 2A, identify the courses to be examined and record them in column (a). The courses selected could be the entire curriculum or a subset such as high priority courses, courses of a specific level, or the courses pertaining to a particular degree program.

STEP 2 In column (b) record the particular course category (course level is illustrated) for each course listed. A sample Worksheet 2A is shown on the next page for illustration purposes.

STEP 3 Identify the academic periods for which enrollment data are to be obtained and record them in row (c).

STEP 4 For each of the academic periods, identify the type of student enrollment data to be displayed and record in row (d). The

WORKSHEET 2A-SAMPLE

PATTERNS IN COURSE ENROLLMENTS

Academic Period: *Fall Term - 1970 - 75*

Date: *April 15, 1975*

(a) Courses	(b) Course Category (Level)	(c) Academic Period			1970			1971			1972			1973			1974			(e) Projected 1975		
		(d) Majors	Nonmajors	Total	Majors	Nonmajors	Total	Majors	Nonmajors	Total	Majors	Nonmajors	Total	Majors	Nonmajors	Total	Majors	Nonmajors	Total	Majors	Nonmajors	Total
History 100	*Lower*	*50*	*5*	*(55)*	*53*	*7*	*(60)*	*62*	*12*	*(74)*	*68*	*25*	*(93)*	*70*	*35*	*(105)*	*75*	*40*	*(115)*
History 200	*Lower*	*-*	*-*	*-*	*45*	*3*	*48*	*50*	*5*	*55*	*52*	*10*	*62*	*40*	*20*	*60*	*35*	*30*	*65*
History 625	*Graduate*	*20*	*3*	*23*	*15*	*10*	*25*	*12*	*15*	*27*	*8*	*17*	*25*	*8*	*21*	*29*	*10*	*25*	*35*

illustration on the sample Worksheet 2A shows a breakdown of majors, nonmajors, and total. Some units may prefer to provide a "major-minor-total" breakdown.

STEP 5 Obtain the enrollment data for each cell. These data could be obtained from various sources, the most likely being the institutional student files or the unit's own records.

STEP 6 After the enrollments are recorded in the appropriate cells, examine the pattern for each course to determine if any trends are apparent.

STEP 7 Information about past enrollment patterns might be used as a basis to project expected enrollments for the forthcoming academic period [see column (e) of the sample Worksheet 2A for a projection based on the trend shown in the illustration].

Admittedly, it is tedious and time-consuming work to sort through student records to pull out the relevant data. If the data already are displayed by an office in a desirable format, the task is minimized. Nonetheless, once Worksheet 2A has been prepared, it can be filed and kept for future reference should previous enrollments be needed for analysis purposes.

Procedures for Examining Expected Student Demand (Course Enrollments)

This section can be used to examine expected student demand for the unit's courses. The use of several information sources are suggested to help in the examination: (1) previous course enrollments (IWLM), (2) preregistration if conducted, (3) surveys of student expectations, and (4) key indicators/events that signal enrollments to expect in particular courses. Since course offerings typically are planned at least one year in advance, previous course enrollments probably will be used as the initial estimates. However, to arrive at a best estimate, preregistration, student surveys, and/or recent changes in current events also can be valuable in providing course information on a short-term basis, for example, two to four months in advance. In addition, it is known that many academic unit administrators look toward the two or three key indicators/events that provide clues on what to expect in coming terms. For example, in a Journalism department that had a high number of in-state students, a summer workshop attended by graduating high school seniors in the state provided a key indication of the size and interests of the incoming freshman class. Also, many institutions have a "lock-step" curriculum that makes it much easier to predict enrollments for the planned academic year, that is, courses and enrollments of the curriculum are controlled on a "block" basis and therefore have little variance from period to period.

The following procedures are to be used in conjunction with a blank form of Worksheet 2B found on page 43 . Also, to assist with the use of these

procedures, a completed sample of Worksheet 2B can be found on the next page. However, before proceeding, it is emphasized that Worksheet 2B provides information similar to information that can be obtained from an institution's IWLM and therefore any unit already receiving IWLM data may choose not to use these procedures.

STEP 1 Using a blank form of Worksheet 2B, identify the courses to be examined and record these in column (a) of Part 1 of the worksheet.

STEP 2 In column (b) record the particular course category (course level is illustrated) for each course listed.

STEP 3 Identify the various types of student majors that take courses in the unit and record them in row (c) of the worksheet. The majors other than those the unit wants to identify explicitly can be lumped together under "All Others." Subdivide each major by a student identifier (student level is illustrated) and record them in row (d).

STEP 4 Estimate the number of headcount students by student level and majors who will be enrolling for the planned courses and record the headcount enrollment, in the appropriate cells. The projections obtained from using Worksheet 2A can be the estimates if desired. In cases where an atypical increase

WORKSHEET 2B-SAMPLE

Planning Period: [illegible]

EXPECTED COURSE ENROLLMENTS

PART I
UNIT [illegible]

(c) Student Major

(d) Student Identifier (Level)

(e) Expected Enrollment of Majors

PART 2
CALCULATING THE NUMBER OF SECTIONS

(a) Courses	(b) Course Category (Level)													(f) Total Course Enrollments: Own Majors	Others	Total	(h) Desired Section Size	Number of Sections Required	Sections Required	Sections Planned Additional
History 100	Lower	[illegible]			10			10			[illegible]	15		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
History 200	Lower	25	10		10			[illegible]						25	20	[illegible]	30	[illegible]	[illegible]	1
History 300	Upper		40						10		[illegible]			40	30	70	[illegible]	[illegible]	3	[illegible]
History 400	Upper		20	5		10								25	10	35	20	[illegible]	[illegible]	[illegible]
History [illegible]	Grad			10			5			15			[illegible]	10	15	[illegible]	25	[illegible]	[illegible]	0
(g) Total Headcount Enrollments		100	70	15	20	10	5	30	10	25	25	15	5	155	135	320				

or decrease in course enrollment is anticipated, the headcount should be adjusted appropriately. In addition, obtain for each major and student level the expected headcount number of declared majors for the specific planning period and record in row (e). For example, in the sample Worksheet 2B, (100) lower division history majors are indicated.

For those courses for which there are no sources of enrollment data, the expected enrollments can be estimated subjectively or from informal student surveys. Record the estimated enrollments in the appropriate cells.

STEP 5

After the expected enrollments for each course to be offered are recorded, sum the expected enrollments for each course across all majors and student levels and record the subtotals in column (f), keeping separate the totals for the unit's own majors and the majors of other units. This distinction is not necessary but may be useful in identifying the proportion of students from other departments who are being served by the unit in question.

STEP 6

Similarly, sum the expected enrollments for each major and student level and record the subtotals in row (g).

Note that Part 1, the completed matrix, now displays an IWLM for the academic unit expressed in headcount enrollments for each course, by student major and level. The level of detail for Part 1 should be changed to meet the needs of each administrator. If less detail is desirable (courses aggregated by lower division, upper division, graduate levels), the institutional office should be able to generate an IWLM with those dimensions. If not, Worksheet 2B can be used.

Procedures for completing Part 2 of Worksheet 2B have been provided for those who would like to calculate initially the number of sections to offer for each course based on the expected total course enrollments identified in Part 1.

STEP 7 Identify a desired section size for each course, taking into account such factors as institutional or unit decision rules or constraints regarding minimum and maximum course enrollments, facilities available, and budget constraints, and record it in column (h) of Part 2 of the worksheet.

STEP 8 Determine the number of sections required for each course by dividing the "Total" column of the Total Course Enrollments in column (f) by the corresponding Desired Section Size in column (h) and record the quotient in column (i).

STEP 9

In column (j), record for each course the number of sections the unit is required to offer and the additional sections to offer should sufficient resources or student demand exist. Usually, policies will provide guidelines for the number of sections to offer; however, demand and/or faculty availability may influence the number of sections to offer.

STEP 10

The number of sections required for each course in column (i) and the number of sections planned for each course in column (j) can be used as the basis for investigating planning alternatives when the final estimate of enrollments is made. For example, if demand should exceed planned number of sections, some alternatives are to change section sizes, modes of teaching, or the planned number of sections.

STEP 11

If any additional information is obtained about changes in student demand, the worksheet can be updated to reflect the current status of expected course enrollments.

STEP 12

After the academic period for which the expected enrollments were planned has transpired, actual enrollments can be obtained from each course section and Worksheet 2B can be updated and filed for future reference.

Procedures for Examining Other Academic Demand

While the previous section dealt with an examination of student demand, it is equally important for the administrator to determine the demands for noninstructional functions to facilitate resource allocation, identify levels of activity, and determine outcomes. In this case, the following procedures used in conjunction with Worksheet 2C on page 45 can assist with this task. A completed sample of Worksheet 2C can be found on the next page.

STEP 1

Using a blank form of Worksheet 2C, record the unit's functions (other than instruction) and identify and record the corresponding demand for each function in column (a). (These functions can be obtained from Worksheet 1A in Module 1 if it was used).

For those functions for which demand information is unknown, obtain it either formally (see Faculty Planning Form in Appendix D) or informally from constituents and colleagues and also record it in column (a).

STEP 2

The demand information now provides a basis from which resource assignments can be made, the expected type and level of activity can be planned, and the planned outcomes can be identified. If desirable, information about these aspects can be recorded in columns (b) through (i) of the worksheet (see sample Worksheet 2C on the following page).

WORKSHEET 2C-SAMPLE

OTHER ACADEMIC DEMAND

Planning Period: Fall 1975

Date: April 2f, 1975

Noninstructional Functions	(a) Demand	(b) Faculty/ Staff Involved	(c) Expected FTE Assignment	(d) Sponsoring Agency	(e) Agency Contact	(f) Project Funding $	(g) Duration Start	(g) Duration End	(h) Outcomes/ Products Desired	(i) Comments
Research Project #1: History of the American Indian	.5 Faculty FTE	Bright	.3	National Endowment for Humanities	Dr. Richard Cook, Director of Publishing 808-632-5816	$ 6,500	9/20/75	12/31/75	Book manuscript submitted to publisher	
Research Project #2: The Use of Computers in the History Discipline	.3 Faculty FTE	White	.3	Social Science Research Unit	Dr. Allison Thomas, Research Associate 402-376-1922	3,500	9/20/75	12/31/75	Articles for journal published by the unit	
State Conference of U.S. Historians	35 Participants	Wong Librarian	.1 .1	State Board of Education	Mary Jones Coordinator 402-173-2900	1,500	11/15/75	11/17/75	Agenda; Presentations by Wong and Bright; Report on Conference	A report of conference due to State Board by 1/7/76.
History Seminar	25 Community members	Kowalski	-	City Government	Mr. Farr, Community Education Coordinator 402-185-2763	600	9/25/75 9 a.m.	9/25/75 Noon	3 hour seminar in U.S. Minority History	One-time effort.
Course & Curriculum Development	Beginning History course to serve 250 entering freshmen	Kowalski Wong	.1 for each member	Institutional Committee on Curriculum Development	Dr. Larry Vaze, Chairman Ext. 7126	N/A	9/20/75	11/15/75	Beginning History Course for Institutional Core Program	
Faculty Council Participation	2 Faculty members for each unit	White Door	.05 .05	University Faculty Council	May York, Chairperson Ext. 7223	N/A	9/20/75	12/31/75	N/A	
Thesis Advising	20 Master's students	White, Door, Kowalski, Wong, Bright	-	-	-	-	9/20/75	12/23/75	Thesis Completion	

Potential Uses of Academic Demand Information

The information about demand provided by the worksheets and procedures can be useful for planning and management in several ways.

First, the student demand information can help the administrator to determine which majors (field of study) take courses offered by the academic unit and thus provides a start toward analyzing the "servicing" aspect of the particular unit.

Second, historical patterns of course enrollments can provide a picture of general trends in student demand changes and therefore help the administrator to anticipate some modifications in the instructional functions of the unit.

Third, student demand information based on previous course enrollments, preregistration data, student surveys, and key events/indicators can provide an estimate from which the administrator can plan (on a more informed basis) the instructional functions to conduct within the unit. Furthermore, Worksheet 2B can serve as the unit's IWLM from which data can be analyzed and communicated for reporting purposes. These estimates can be coordinated with the institutional level to obtain a better picture of the unit's expected enrollments.

Finally, information about the demands made on other functions of the academic unit may enable the administrator to plan better the resources, activities, and outcomes of the unit by knowing more clearly what is expected and the amount of service necessary in carrying out those functions.

MODULE 3

PLANNING FACULTY RESOURCES
((3) FACULTY PLANNING MODULE)

Introduction

Faculty resources are important simply because the success of institutional programs depends primarily on them. Faculty form the base of operation for most institutions, and especially within the academic unit, the instructional, research, public service, and administrative support functions revolve around them. Thus, the assignment and use of faculty resources is a central focus of the academic unit's planning and management process because that process must be cognizant of interrelationships among faculty capabilities and interests, expected student enrollments, specific activities to be conducted within the unit's functions, the physical resources for supporting those activities, and administrative guidelines and constraints. The way in which faculty are assigned and the capabilities they have often govern the scope and direction of a unit. From among these interrelationships, several processes that are integral to the planning of faculty resources can be identified. These are:

1. Identifying the specific activities to be conducted by the faculty of a unit. These activities are to be carried out for accomplishing the unit's functions identified in Module (1) , Worksheet 1A. For example, an instructional function (course) may be offered in 10 sections for lecture (activity) and 20 sections for recitation (activity).

2. Identifying faculty capabilities, availabilities, and assignments for conducting activities. For example, Professor Wong's strength is in U.S. History, he will be on sabbatical in the Spring, and he has taught graduate courses for the past five terms.

This module provides worksheets and procedures to determine the availability of faculty resources and identify some tentative assignments of those resources to activities (assignments are made for both groups of faculty and individual faculty). Furthermore, information about faculty capabilities, interests, and availabilities are used to facilitate the assignment process. In effect, these aids assist in examining alternative matches between faculty and activities.

Key Considerations in Planning Faculty Resources

Obviously, faculty workload requirements must be taken into account when planning the use of faculty resources. Although research and much debate have centered upon the determination of a way to arrive at equitable faculty workload, there is no consensus regarding a best way, much less that a best way even exists. In some academic units, workload assignments are made on the basis of the number of course sections to be taught; in others, contact hours are used; and in still others, a weighted point system is the basis. Moreover, faculty workload in some units consists of only those activities formally funded by the institution whereas in others workload specifically includes professional development, graduate student advising, committee work, and even consulting.

In addition, there are other factors that might influence workload, such as the amount of effort required for an activity, the class size, course credit hour, and faculty contact hours for a course. While research does not substantiate whether these factors justify workload variations, they become important if a unit's members perceive them as justifying such variation (Yuker, 1974).

Another important consideration in planning faculty resources is the mix of short-term and long-range decisions concerning the faculty required to carry out the unit's activities. For example, in determining teaching schedules for the next term, decisions must be based on immediate faculty availabilities and capabilities. However, in the longer run, depending upon the kind of curriculum the unit wants to offer, decisions about the number and kind of faculty capabilities needed to support the planned curriculum can be made on a carefully planned basis.

Worksheets Provided

There are several worksheets provided in this module to plan and examine the use of faculty resources. These worksheets are found on the next five pages and are:

Worksheet 3A: Summary of Expected Course Sections

This worksheet can be used to organize and record the number of sections to offer for each of the courses that were planned. One way to obtain this information is through the examination of student demand supported by Module (?).

WORKSHEET 3A

SUMMARY OF EXPECTED COURSE SECTIONS

Planning Period: _____

Date: _____

Courses to be Offered During the Academic Year	Activity Category (Course Level)	Academic Year		Fall		Winter		Spring	
		* # of Course Units that are Required to be Offered	# of Additional Course Units that May be Offered	# of Course Units that are Required to be Offered	# of Additional Course Units that May be Offered	# of Course Units that are Required to be Offered	# of Additional Course Units that May be Offered	# of Course Units that are Required to be Offered	# of Additional Course Units that May be Offered

*Course Units - to be defined by the administrator. For illustration purposes, the data refer to "Course Section."

WORKSHEET 3B

(a) Faculty Planning Form* Page 1 of 2

Name _____ Department _____

Rank _____ Planning Period _____ _____

Teaching FTE (1.0 = Full-Time) _____ Salary (Optional) _____

(b) Overall Comments Regarding Plans for the Next 2-3 Years:

(c) Faculty Workload

Academic Years		Fall		Winter		Spring	
# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct

(d) A.1 Scheduled Teaching

List Those Courses You Can and Would Like to Teach		Fall			Winter			Spring		
Dept. Prefix	No.	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***

*Adapted from Faculty Activity Analysis: Procedures Manual (Manning and Rowney, 1973)

**Course Units - to be defined by the administrator. For illustration purposes, the data refer to "Course Section."

***Preference Scale:
0 - would only teach if no one else is available
1 - would not like to teach
2 - indifferent
3 - would like to teach
4 - would strongly like to teach
5 - would most like to teach

(e) Activity Category	(f) Activity Description*	(g) Estimated Average Weekly Workload**		
		Term 1	Term 2	Term 3
A.2 Unscheduled Teaching	Thesis Committee Participation	1.0	1.0	1.5
A.3 Academic Program Advising	Course Scheduling and Academic			
	Planning Consultations	3.0	2.0	2.5
A.4 Course and Curriculum Res. & Dev.	Developing Dept. Curriculum Requirements	1.5	1.0	2.0
Section B. Research, Scholarship, and Creative Work Activities				
B.1 Specific Projects	Administering Research Grants	.5	.5	1.0
	Departmental Research	.5	.5	.5
B.2 General Scholarship and Professional Development	Officer in a Professional Society	.25	.25	---
	Reading Professional Journals	2.0	3.0	1 0
Section C: Internal Service Activities				
C.1 Student-Oriented Service	Preparing Recommendations	.25	.25	.5
	Sponsoring Student Organizations	2.0	2.0	2.0
C.2 Administrative Duties	Department Administration	25 0	20.0	25.0
	Recruiting Faculty	5	1.0	2.0
	Preparing Budgets	2.0	2 0	4.0
C 3 Committee Participation	Faculty Council	1.0	1 0	1 0
	Departmental Meetings	2.0	2.0	2.0
	Joint Budget Committee	1.0	1.5	3.0
	Facility Planning Commission	1 5	1.0	1 0
Section D Public Service Activities				
General Professional Services Directed OUTSIDE the Institution	Community Relations	3.0	3 0	3.0
	Consulting	---	2 0	---
Section E Technical Services Activities				
Technical Management and Support				

(h)	Average weekly workload in Addition to Teaching [illegible]	47 0	44 0	52 0

*These descriptions should be expressed in terms familiar to the [illegible] unit members

**Expressed in [illegible] weekly [illegible] for [illegible] purposes. The [illegible] measure [illegible]

WORKSHEET 3C

FACULTY ALLOCATIONS-BY RANK AND COURSE LEVEL

Planning Period _____

Date: _____

(c) Faculty Rank / (b) Expected Demand	(a) Course Level				(d) Numbers of Faculty (FTE)	(i) Sections/ Faculty	(j) Faculty Research Time (FTE)	(k) Faculty Service/ Other Time (FTE)
(e) Total Sections								
(f) Average Section Size								
(g) Satisfied Demand								
(h) Unsatisfied Demand								

*Adapted from (Hoenack, et al., 1974: p. 262)

WORKSHEET 3D

MATCHING INDIVIDUAL FACULTY TO SPECIFIC ACTIVITIES

PLANNING PERIOD:

DATE.

		FACULTY NAME AND RANK																	
		(d) FAC LOAD																	
(a) FUNCTIONS (COURSES)	(b) AY LOAD	(c) TERM LOAD	F	W	S	F	W	S	F	W	S	F	W	S	F	W	S	(g) COURSE UNITS MATCHED/TERM	(h) NUMBER OF COURSE UNITS (OVER) OR UNDER MATCHED
		F																	
		W																	
		S																	
		F																	
		W																	
		S																	
		F																	
		W																	
		S																	
		F																	
		W																	
		S																	
		F																	
		W																	
		S																	
(e) TOTAL TERM LOAD																			
(f) TOTAL FAC LOAD																			

Worksheet 3B: Faculty Planning Form

This worksheet can be used to solicit or reflect information about each faculty member's plans for the period under consideration. (Instructions for completing this form can be found in Appendix D.) This form has been adapted from the Faculty Activity and Outcome Survey Form contained in the NCHEMS document, Faculty Activity Analysis: Procedures Manual (Manning and Romney, 1973). Those interested in pursuing a faculty activity analysis may wish to refer to that document for more detailed information.

Worksheet 3C: Faculty Allocations-by Rank and Course Level

This worksheet can be used to investigate the consequences of allocating faculty by rank and course level. It enables the administrator to change several planning parameters to examine alternative allocations of faculty (Hoenack, et al., 1974).

Worksheet 3D: Matching Individual Faculty to Specific Activities

This worksheet also can be used to investigate the consequences of matching individual faculty to specific activities. Although similar in concept with Worksheet 3C, it provides more detailed information about the tentative assignments of individual faculty members to the activities.

Procedures for Determining Faculty Capabilities and Availabilities

Often, simply investigating the unit's functions and their related activities and faculty plans will provide information useful for planning and management purposes. This set of procedures can help to obtain information about what faculty can do, plan to do, and what specific activities are to be conducted during a specified academic period. Thus, the information will assist in determining faculty capabilities and availabilities for carrying out the unit's functions.

STEP 1

The first step is to decide the extent to which the unit's faculty will participate in providing information about their availabilities and interests. The administrator will be using Worksheet 3B to obtain faculty information; however, this worksheet can be completed without any formal participation by the faculty. The following steps assume faculty participation.

STEP 2

The administrator uses the institutional IWLM or unit student files to estimate initially the unit's student demand and converts the demand information into course units using Worksheet 3A. (Although Module (2) of this document can be used to estimate this student demand, many administrators can complete Worksheet 3A without going through all the details explained in Module (2) and therefore it has been provided in this Module (3)).

STEP 3

Then, send a completed Worksheet 3A and a blank Worksheet 3B to each faculty member. At this time, any administrative guidelines to be considered by the faculty member in completing the worksheet are sent also. For example, the administrator might require that each faculty member list at least one "core" or "foundation" course to teach from the list reflected in Worksheet 3A. (Samples of completed Worksheets 3A and 3B are provided on the next three pages.)

STEP 4

Each faculty member completes Worksheet 3B, reviews and suggests updates on the information provided by Worksheet 3A, and returns the worksheets to the administrator. Worksheets 3A and 3B now provide a wealth of information that can be used for planning and management purposes. Worksheet 3A can be used as an inventory of the courses and course units to be offered for the specified academic period; Worksheet 3B can be used as an inventory of faculty capabilities, their preferences for various activities, and the time they expect to expend in each; and Worksheet 3B can serve also as a vehicle to foster discussions between the individual faculty member and the administrator regarding workload for the specified academic period.

WORKSHEET 3A-SAMPLE

SUMMARY OF EXPECTED COURSE SECTIONS

Planning Period: *Academic Year 1975-76*

Date: *April 28, 1975*

Courses to be Offered During the Academic Year → Activity Category (Course Level)	Academic Year		Fall		Winter		Spring	
	* # of Course Units that are Required to be Offered	# of Additional Course Units that May be Offered	# of Course Units that are Required to be Offered	# of Additional Course Units that May be Offered	# of Course Units that are Required to be Offered	# of Additional Course Units that May be Offered	# of Course Units that are Required to be Offered	# of Additional Course Units that May be Offered
Hist 100 — *Lower*	15	1	6	0	4	1	5	0
Hist 200 — *Lower*	8	2	3	0	3	1	2	1
Hist 340 — *Upper*	3	0	1	0	1	0	1	0
Hist 410 — *Upper*	7	1	3	1	2	0	2	0
Hist 455 — *Upper*	4	0	1	0	2	0	1	0
Hist 570 — *Upper*	2	1	1	0	0	1	1	0
Hist 600 — *Grad*	3	0	1	0	1	0	1	0
Hist 625 — *Grad*	1	1	0	0	0	0	1	1

*Course Units - to be defined by the administrator. For illustration purposes, the data refer to "Course Section."

(a) Faculty Planning Form*

Name _____ Department _____

Rank _____ Planning Period _____

Teaching FTE (1.0 = Full-Time) _____ Salary (Optional) _____

(b) Overall Currents Regarding Plans for the Next 2-3 Years:

_____

(c) Faculty Workload

Academic Year		Fall		Winter		Spring	
# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct

(d) A.1 Scheduled Teaching

List Those Courses You Can and Would Like to Teach		Fall			Winter			Spring		
Dept. Prefix	No.	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***

*Adapted from Faculty Activity Analysis: Procedures Manual (Manning and Romney, 1973)

**Course Units - to be defined by the administrator. For illustration purposes, the data refer to "Course Section."

***Preference Scale:
0 - would only teach if no one else is available
1 - would not like to teach
2 - indifferent
3 - would like to teach
4 - would strongly like to teach
5 - would most like to teach

(e) Activity Category	(f) Activity Description*	(g) Estimated Average Weekly Workload**		
		Term 1	Term 2	Term 3
A.2 Unscheduled Teaching	Thesis Committee Participation	1.0	1.0	1.5
A.3 Academic Program Advising	Course Scheduling and Academic			
	Planning Consultations	3.0	2.0	2.5
A.4 Course and Curriculum Des & Dev.	Developing Dept. Curriculum Requirements	1.5	1.0	2.0
Section B. Research, Scholarship, and Creative Work Activities				
B.1 Specific Projects	Administering Research Grants	.5	.5	1.0
	Departmental Research	.5	.5	.5
B.2 General Scholarship and Professional Development	Officer in a Professional Society	.25	.25	---
	Reading Professional Journals	2.0	3.0	1.0
Section C. Internal Service Activities				
C.1 Student-Oriented Service	Preparing Recommendations	.25	.25	.5
	Sponsoring Student Organizations	2.0	2.0	2.0
C.2 Administrative Duties	Department Administration	25.0	20.0	25.0
	Recruiting Faculty	.5	1.0	2.0
	Preparing Budgets	2.0	2.0	4.0
C.3 Committee Participation	Faculty Council	1.0	1.0	1.0
	Departmental Meetings	2.0	2.0	2.0
	Joint Budget Committee	1.0	1.5	3.0
	Facility Planning Commission	.5	1.0	1.0
Section D. Public Service Activities				
General Professional Services Directed OUTSIDE the Institution	Community Relations	3.0	3.0	3.0
	Consulting	---	2.0	---
Section E. Technical Services Activities				
Technical Management and Support				
(h)	Average weekly workload in addition to teaching activities	47.0	44.0	52.0

*These descriptions should be expressed in terms familiar to the academic unit members.

**Expressed in average weekly clock hours for all instructional purposes. The academic unit should determine the appropriate time period.

Procedures for Examining the Allocation of Faculty Resources, by Rank and Course Level

In many cases, planning for the use of faculty resources can be done on an aggregate basis before specific faculty assignments are made. If this approach is taken, the allocation of faculty resources can be done by faculty rank (or another grouping of faculty) and course level. From the information obtained by examining alternative patterns of these allocations, the administrator can decide which particular pattern will meet the needs of the unit in carrying out its functions. The following set of procedures used with Worksheet 3C can assist in allocating faculty on an aggregate basis.

STEP 1 — Using a blank Worksheet 3C, identify and record in row (a) the course levels (lower division, upper division, graduate) of the unit.

STEP 2 — For each course level, record the expected total student demand (based on the most current estimate of the numbers of headcount students) in row (b).

STEP 3 — Identify and record the faculty ranks in column (c) and for each rank record the numbers of faculty (in FTE) in column (d).

STEP 4 — Determine and record in row (e) the total sections to be offered at each course level (can be obtained from Worksheet 3A by totaling the number of sections to be offered for courses of a similar level).

STEP 5

Record in row (f) the average section size at each course level. This section size may be the result of such factors as institutional policy, academic unit guidelines, or facility constraints.

STEP 6

At this point, calculate for each course level the satisfied student demand and record in row (g).

(e) TOTAL SECTIONS	X	(f) AVERAGE SECTION SIZE	=	(g) SATISFIED DEMAND

For example,

(20 Sections at Course Level 1)	X	(35 Headcount Students)	=	(700 Headcount Students)

STEP 7

Also, determine the unsatisfied demand for each course level and record in row (h).

(b) EXPECTED DEMAND	-	(g) SATISFIED DEMAND	=	(h) UNSATISFIED DEMAND

For example,

(1,000 Headcount Students for Course Level 1)	-	(700 Headcount Students for Course Level 1)	=	(300 Headcount Students for Course Level 1)

NOTE: Depending on the numbers of satisfied or unsatisfied enrollments, the administrator may wish to change the number of total sections to offer (STEP 4) or the average section size (STEP 5), if those changes are possible.

STEP 8

Assuming that there is a tentative agreement on the total sections to offer and the average section size, determine a tentative allocation of faculty by rank to each course level ensuring that Total Sections at each course level are not exceeded. (See sample of Worksheet 3C on next page, which illustrates the allocations on the heavily marked area.) For example, 15 Teaching Assistants allocated to Course Level 1.

STEP 9

Based on this initial allocation, determine the average number of sections being taught for each faculty rank and record in column (i).

SUM OF THE ASSIGNED SECTIONS FOR EACH RANK	:	(d) NUMBERS OF FACULTY (FTE)	=	(i) SECTIONS/ FACULTY

For example,

(15 Sections for Rank 1)	:	(6 Faculty FTE)	=	(2.5 Section/ Faculty)

STEP 10

Record in columns (j) and (k) the amount of time (in FTE) spent by each faculty rank in nonteaching functions. This is an *a priori* determination made when the faculty teaching time was estimated. These figures are provided to show that if teaching workload time is changed as a result of investigating an alternative allocation of faculty, the time

WORKSHEET 3C-SAMPLE

*FACULTY ALLOCATIONS - BY RANK AND COURSE LEVEL

Planning Period: *Academic Year 1975-76*

Date: *April 25, 1975*

(c) Faculty Rank	(a) Course Level 1	2	3	4	(d) Numbers of Faculty (FTE)	(i) Sections/ Faculty	(j) Faculty Research Time (FTE)	(k) Faculty Service/ Other Time (FTE)
(b) Expected Demand	*1000*	*400*	*300*	*96*				
1. Teaching Assistant	*15*				*6*	*2.5*		
2. Instructor	*5*	*2*			*3*	*2.3*		
3. Assistant Professor		*4*			*3*	*1.3*	*.5*	*.5*
4. Associate Professor		*2*	*8*	*3*	*9*	*1.4*	*3.2*	*1.0*
5. Professor		*2*	*2*	*5*	*9*	*1.0*	*4.0*	*2.2*
(e) Total Sections	*20*	*10*	*10*	*8*	*30*	*1.6* **	*7.7*	*3.7*
(f) Average Section Size	*35*	*30*	*25*	*12*				
(g) Satisfied Demand	*700*	*300*	*250*	*96*				
(h) Unsatisfied Demand	*300*	*100*	*50*	*0*				

*Adapted from (Hoenack, et al., 1974: p. 262)

**Total Average Sections per Faculty FTE.

available for research and service functions might also change, assuming there are established conventions for trade-offs among teaching, research, and services.

NOTE: Worksheet 3C now reflects a tentative allocation of course sections by faculty rank to course levels.

The following step describes how the administrator can examine other possible alternatives of allocating faculty.

STEP 11 The administrator can make various "changes" to examine alternative allocations. After making a change, the administrator can evaluate its implications upon the other planning parameters reflected by the worksheet.

An example of a change is to increase the sections to be taught by faculty members of a particular rank. There are several implications of this change:

The number of sections to be taught by the existing faculty of a given rank will change proportionally to the change in sections/faculty. For example, a 15% change in sections/faculty for a given rank will change the number of sections to be taught by a given rank by 15% also.

Total sections for a given course level may change. Thus, section size remaining constant, satisfied and unsatisfied student demand will change also.

Given a stable set of teaching, research, and service functions to be conducted, the time available for research and/or service may change.

Another example of a change is to decrease the number of total sections for a particular course level. Utilizing the existing faculty, this could change sections to be taught by each faculty member for a given rank as well as freeing faculty for other assignments. Other changes might be to increase average section size or through policy decide to decrease unsatisfied student demand.

An example of a change that is far reaching is to change the course section allocations among the faculty ranks from one course level to another. Depending upon whether or not total sections for course levels are fixed, this change will typically change the other parameters (satisfied/unsatisfied demand, sections/faculty, average section size, research and service time).

As these examples illustrate, there are a host of possibilities that can be examined by changing various parameters and noting their impact on other parameters. In fact, such parameters as Total Sections, Satisfied/Unsatisfied Demand, and Sections per Faculty, can be viewed as targets that the academic unit can plan to achieve or accomplish during a specified period. The administrator should experiment and examine alternative allocations of faculty resources in iterative fashion until an appropriate set of targets for the particular academic unit can be decided upon.

Procedures for Matching Individual Faculty to Specific Activities

Many academic units will need to plan faculty resources on an individual basis. While this approach is the most time-consuming and complex, the result may be a better matching between faculty capabilities and the unit's functions and related activities. It is emphasized that using this set of procedures does not produce a firm schedule of the courses faculty will teach nor are specific teaching times addressed. The approach taken in this section is based on a technique that matches individual faculty capabilities and preferences with the activities that the unit will conduct during a specified planning period (Dyer, 1973). The information provided by the matching process can be analyzed, and if the administrator desires to investigate other possible uses or assignments of faculty, several planning parameters can be changed and the resulting impacts examined.

NOTE: The "preference" is a measure that determines the strength of the link between a faculty member and a course and is to be defined by the unit. However, the measures are not necessarily the faculty's preferences but may in fact reflect an administrative assessment (administrative preference) of an individual's ability to teach a given course. Also, the measure could be composed from several measures (faculty preference + administrative preference + effectiveness factor) instead of a single measure. An example of a preference scale can be found at the bottom of page 1 of sample Worksheet 3B on page 79.

This set of procedures can be used with Worksheets 3A, 3B, and 3D to investigate in detail the alternative assignments of individual faculty members. A completed sample of Worksheet 3D can be found on the next page to help with the use of these procedures.

STEP 1

Referring to Worksheet 3A, obtain and then record in column (a) of Worksheet 3D the courses to be matched with the faculty and in column (b) of Worksheet 3D the number of required course units of each course to be offered for the academic year (AY). (One course unit = one equivalent course section).

STEP 2

For each course, distribute the academic year load (AY LOAD) to the various academic terms (F = Fall, W = Winter, S = Spring) according to the required and additional number of course units to be offered each term. (The distribution information can also be obtained from Worksheet 3A. For example, for

WORKSHEET 3D-SAMPLE

MATCHING INDIVIDUAL FACULTY TO SPECIFIC ACTIVITIES

PLANNING PERIOD:
Academic Year 1975-76

DATE:
April 3[illegible], 1975

(a) FUNCTIONS (COURSES)	(b) AY LOAD		(c) TERM LOAD	FACULTY NAME AND RANK: *[illegible], Jane Professor*			*[illegible], C. Asst. Professor*			*[illegible] Assoc. Professor*			*[illegible], Allison Teaching Asst.*			*Etc.*			(g) COURSE UNITS MATCHED/TERM	(h) NUMBER OF COURSE UNITS (OVER) OR UNDER MATCHED
			(d) FAC LOAD	4			6			6			3							
				F	W	S	F	W	S	F	W	S	F	W	S	F	W	S		
				1	2	1	0	3	3	2	2	2	1	1	1					
History 100	15	F	*6, 0*	(2)✓			0			3✓			4✓						[illegible]	[illegible]
		W	*4, 1*		(1)✓			0✓			3✓			4✓					1	0
		S	*3, 0*			(3)			0			4✓			4✓				[illegible]	[illegible]
History 410	8	F	*3, 1*	3	.		4			3✓			4						1	[illegible]
		W	*3, 0*		3✓			*5✓			4✓			4					3	0
		S	*2, 1*			3			4✓			3✓			4				[illegible]	0
History 570	2	F	*1, 0*	3			4			3									0	[illegible]
		W	*0, 0*		3			4			2								0	0
		S	*1, 0*			3			4✓			2							1	0
History 625	1	F	*0, 0*	0															0	0
		W	*0, 0*		0														0	0
		S	*1, 0*			5✓													1	0
Etc.		F																		
		W																		
		S																		
(e) TOTAL TERM LOAD				1	2	1	0	2	2	2	2	2	1	1	1					
(f) TOTAL FAC LOAD				4			4			6			3							

*Indicates that the faculty member will be willing to teach multiple sections of the same course. Reflect more than one match by the number of checks made in that cell.

History 100 in the Fall, 6 course units are required and 0 additional; for Winter, 4 course units are required and if demand still needs to be met or faculty are available, 1 additional course unit might be offered, and so forth. (Note that semesters can be used instead of quarters.)

STEP 3

From the set of completed Worksheets 3B containing information about faculty plans and preferences, obtain and record the following information on Worksheet 3D:

Obtain from section (c) of Worksheet 3B the academic year faculty teaching load (FAC LOAD) of each member (expressed in the number of course units that the member is expected to teach during the year) and record in row (d) of Worksheet 3D. For example, Jane Door is required to teach 4 course units during the year.

Then, distribute each member's academic year teaching load across each academic term and record in row (c) of Worksheet 3D. For example, for Jane Door, 1 course unit in the Fall (F), 2 in the Winter (W), and 1 in the Spring (S) quarter. (Information about how the annual teaching load is distributed can be obtained from section (c) of Worksheet 3B.)

NOTE: The workload unit to be used is a choice of the administrator but typically will reflect the institution's policy. The illustration uses "course units" where a course unit is equal to the time and effort required to teach one actual course section. Many institutions specify semester or quarter hours as the measure of workload.

STEP 4

From the list of courses each member is capable of teaching (section (d) of Worksheet 3B), obtain the preference for each course and record in the appropriate cell of Worksheet 3D. For example, Professor Jane Door indicated a preference of 2 for teaching History 100 in the Fall, 0 for teaching in the Winter, and 2 for the Spring. These preferences are indicated for the corresponding courses on Worksheet 3D as shown by the circled numbers ((2) , (0) , (2)). If a faculty member desires to teach multiple units of a course, an indicator such as an asterisk could be marked in that cell to recall that information.

STEP 5

The matching process can now begin. Each match will be made by (1) taking a course to be offered in a given term, (2) scanning that row for the higher preferences, (3) making a tentative match between the highest preference and the course by placing a mark, (4) checking certain indicators to ensure that the specifications of sections and teaching loads have not been violated, and finally (5) confirming the match. If

desirable, alternative approaches to the matching process are available. For example, the teaching loads of all full professors can be matched first or all predetermined assignments can be made first and the rest matched iteratively.

For example (see sample Worksheet 3D):

(1) Select a course to be offered in the Fall term (6 course units of History 100 to be offered in the Fall).

(2) Scan the row corresponding to History 100 for the Fall and identify the higher preferences expressed by faculty members. According to the worksheet, Marr and Wong have expressed the highest preferences for History 100. Kowalski has indicated a preference of 0, while Door has indicated a 2.

(3) Keeping in mind the number of course sections to be offered for History 100 (6), matches can be made for History 100 by placing a check (✓) in the appropriate cell for Door, Wong, and Marr. Typically, the administrator will know from past experience which faculty members always teach a particular course and therefore some matches may have been predetermined.

(4) Check the following indicators to ensure that specifications have not been exceeded.

Column Check: Check to ensure that the TERM LOAD in row (c) for each faculty member has not been exceeded. For example, Jane Door's TERM LOAD for the Fall is 1, that is, Door is required to teach one course unit in the Fall. Therefore, when making a match for Jane Door, check whether her TERM LOAD indicated in row (c) has been satisfied. If it has not been, a match can be confirmed and the (✓) left as is. If it has, then, the (✓) should be removed and other faculty members capable of teaching the course should be considered. Record the number of confirmed matches in row (e) TOTAL TERM LOAD.

Row Check: Check to ensure that the number of course units to be offered for a course during each term is not exceeded. For example, History 100 is required to have 6 course units offered in the Fall. Upon checking, only 3 matches have been identified so far. Record this figure in column (g).

(5) Continue, in an iterative fashion, to match faculty members and each course according to the preferences or predetermined matches. As row and column checks are made, adjustments and confirmations can be made.

STEP 6

Assuming that a tentative assignment pattern is obtained, the following results of the matching process can now be examined:

Rows (e) and (f): These rows can be examined relative to rows (c) and (d) to determine which faculty members still can accept additional load because their yearly or term loads have not been met. Also determine which are carrying overloads. (On the sample Worksheet 3D, Kowalski is available for two more course units; 1 in the Winter and 1 in the Spring.)

Columns (g) and (h): For each course for a given term, compare the number of course units recorded in column (g) with the number of course units recorded in column (c) to determine the number of units that were either over or under matched per term in column (h). As an example, the sample Worksheet 3D shows that according to column (c), 6 units of History 100 were to be offered in the Fall. Comparing this with column (g), which indicates that 3 course units have been matched, 3 course units of History 100 for the Fall term still are unstaffed as shown in column (h).

STEP 7

If desirable, the administrator can change parameters on the worksheet to examine other possible assignments. For example, one change is to modify the academic year teaching load of specific individuals in order to staff more course units. Obviously, this may necessitate changing the individuals' term load; however, it may have an impact on the individual's salary and also be contrary to institutional or academic unit policy. Another example is to assign faculty members available for more assignments to conduct more than one unit of a course as another means to reduce the number of unstaffed units of a particular course. Another example is to shift or modify the number of course units to offer during any given term. The number and composition of faculty may be changed also.

The administrator can experiment with various changes until an acceptable faculty assignment pattern is reached. The particular change the administrator chooses to investigate will depend upon whether the worksheet is being used for short-term or long-term planning of faculty resources. Obviously, changing the composition of faculty might be a more long-term planning option. The following examples of summary reports can be produced from Worksheet 3D to reflect the results of a particular assignment pattern:

- A summary list of courses and course units each member is planned to teach, by term.

- A summary of the number of planned and additional course units staffed and the number unstaffed.

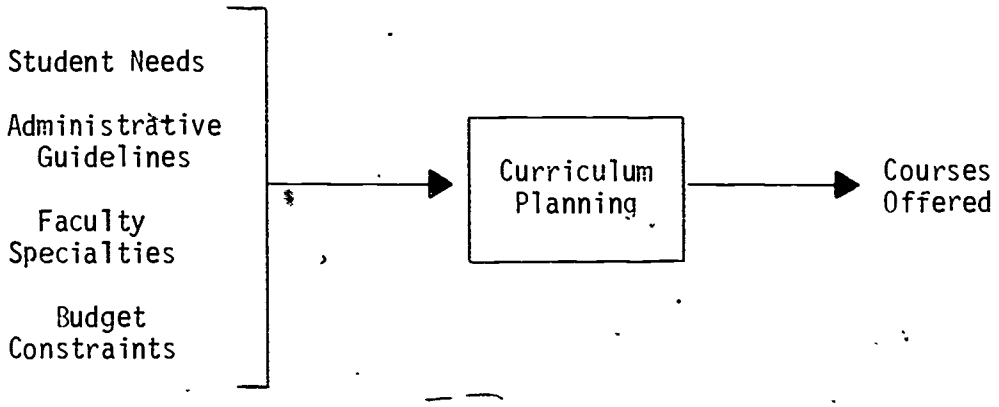
- A summary of the planned and additional faculty workload (expressed in course units) assigned and the faculty workload still available.

In short, the worksheet and procedures can assist the academic unit administrator in planning the use of faculty resources. By varying such parameters as the number and composition of faculty, the courses and course units to offer, the teaching load of faculty, and the "preference" for a particular course, different patterns of faculty assignments can be examined.

Potential Uses

There are several situations in which information provided by using Worksheets 3C and/or 3D and the procedures can be used to examine the use of faculty resources. One example is the use of these tools in the curriculum process that involves the interaction of several factors as illustrated in the following figure:

FIGURE 7: CURRICULUM PLANNING PROCESS



To illustrate, assume that a new required course is to be added to a degree program. By matching available faculty specialties with the current and proposed courses, the chart can provide information that would be useful in determining whether or not present faculty resources are sufficient, in terms of number and skills, to staff the new course. In addition, the worksheets can be used to investigate alternative staffing patterns resulting from the matching of faculty to the courses of the proposed curriculum.

Another example of use is in investigation of the effects of incremental changes in the academic unit's budget. As an illustration, assume that the budget has been decreased. There would be a need to examine the possible tradeoffs, such as the mix of faculty and courses that could be accommodated more appropriately with the funds available, the courses that should be offered and those that might be dropped, and the impact on

the unit's faculty specialties if the number of faculty must be decreased. Through the analysis of matching courses to faculty, the worksheets can assist in determining the most desirable changes or "moves" within the constraints of the adjusted budget.

A third example is to examine shifts of student demand. Assume that the History Department changes its program emphasis in such a way as to require its students to take a new course sequence offered in the Mathematics Department. It is expected that this change will result in an increase in the number of History students that take courses in Mathematics. The worksheet can be used in this instance to analyze the faculty resources required within the Mathematics Department to support the new influx of students for its courses. The chart can aid in determining whether or not sufficient faculty are available and if existing course assignments need to be modified.

In summary, while the results from using the worksheets may not be the final policies and decisions regarding the appropriate use of faculty resources, they can serve as reference points from which to examine this area and to identify alternatives and tradeoffs. Also, the assignment of faculty resources to nonteaching functions was not explicitly handled by the worksheets. It is assumed that the proportion of time available for instruction, research, and public service or other functions and activities could be determined on an *a priori* basis and therefore the use of faculty for instruction as reflected in Worksheets 3C and 3D already accounts for time to conduct nonteaching functions.

Finally, the use of Worksheet 3D can be very cumbersome for large departments. However, the worksheet can be designed (bulletin board form) to accommodate the size of the academic unit; or perhaps, more appropriately, academic units with 25 or more faculty may use the worksheet by natural divisions within the academic unit (academic specialization), thus reducing the size of the problem and making the use of the worksheet feasible again.

Furthermore, for those interested in computer software to facilitate the faculty planning process, NCHEMS has developed a Faculty/Activity Matching Model that can help to expedite the investigation of alternatives and tradeoffs regarding the use of faculty resources. Although this model is operational on the CDC 6400 computer facility at the University of Colorado, it has not been generalized for widespread use. Those interested in this model can make inquiries to the authors of this document.

MODULE 4

PLANNING FINANCIAL RESOURCES
((4) FINANCE MODULE)

Introduction

In many instances, the funds provided directly to the academic units of an institution are general instructional monies and research grants and contracts. However, as the competition for funds increases, it becomes more essential for the academic unit administrator to understand clearly both the sources and uses of the current funds provided to the unit. Knowing how funds are used and where they come from will help the administrator manage and allocate funds for carrying out the current and future functions (identified in Module 1).

The purpose of this module is to help the administrator determine the availability and use of the unit's funds. This assistance is provided in the form of a source/use format for organizing and analyzing information about the flow of financial resources within the academic unit.

Before proceeding, there are several considerations about the planning and management of financial resources at the academic unit level.

1. The financial resources provided to higher education institutions are either restricted or unrestricted funds. In the case of "restricted" funds, very specific instructions are given by the

donor concerning the way in which the institution may use the funds. Therefore, institutions typically maintain records that identify the source of all restricted funds in order to report that the funds were indeed used for the purposes for which they were given--there is little flexibility in the way restricted funds can be used. On the other hand, "unrestricted" funds have no donor stipulations regarding their use and therefore are usually drawn upon to pay for those activities that the institution needs to carry out but for which restricted funds have not been provided.

2. The bulk of funds received by the academic unit usually consists of the institution's budgeted allocation for the unit. These institutionally budgeted funds are usually "designated" by the institution's management for particular purposes. However, these designations often can be changed if good and sufficient reasons can be provided for doing so.

The sources of the institutionally budgeted funds provided to the unit are not traceable from the unit's perspective and therefore these funds should be considered as a single source pool (referred to as "Institutional Budget for Unit X"). While the sources of the institutional budget pool are not identifiable, these funds usually are allocated to the unit's various accounts, which are closely related to the intended use of the funds (Account 10025 = $350,000 for faculty salaries, Account 20017 = $5,000 for departmental research).

3. In addition to institutionally budgeted funds, units often receive funds from sources external to the institution. These monies are often in the form of research grants obtained by individual faculty members and private gifts restricted to particular use by the unit.

4. From the unit administrator's viewpoint, the funds provided to the unit usually will be accounted for in unit accounts. Whether the funds in an account are from such sources as government grants, private gifts, or return on portfolio investments, usually will be apparent to the administrator by the particular account in which they are maintained.

Worksheets Provided

The worksheets provided in this module (shown on the next two pages) help the administrator to plan and manage the financial resources available to the unit. The worksheets are:

Worksheet 4A: Unit Accounts

This worksheet helps the administrator identify the "accounts" of the unit, describe management's flexibility relative to the use of funds in each account (restricted, designated, unrestricted), and summarize the unit's total current operating funds in an organized fashion. The unit may choose to establish its own managerial prerogatives or even select another dimension such as "priority" to describe the use of the funds in any particular account.

Worksheet 4B: Uses of Funds

This worksheet enables the administrator to identify the particular uses for which the current operating funds are being expended and to plan for the future need for unit funding in a systematic manner.

The categories used in analyzing expenditures should be determined by the academic unit. For example, one way to categorize expenditures is by the functions conducted by the academic unit. Another categorization might be by using the typical accounting line item categories of salaries, travel, equipment, supplies, and services. For that matter, the unit may decide to combine both functions and line item categories or use another scheme. In most cases, the institutional policy for the distribution of the funds will dictate the category of use adopted by the unit. In this manual, both uses by functional category and objects of expenditure category are illustrated.

Procedures for Examining the Availability of Financial Resources (Sources of Funds)

This section consists of a set of procedures for examining the availability of the unit's financial resources and helps in analyzing certain characteristics of those funds.

WORKSHEET 4A

UNIT ACCOUNTS

Planning Period: _____

Date: _____

(a) Account Code	(b) Account Name	(c) Degree of Flexibility in Using These Accounts		
		Restricted	Designated	Unrestricted
(d)* Total Current Operating Funds				

WORKSHEET 4B

USES OF FUNDS

Planning Period: _____

Date: _____

(c) Uses of Funds	Restricted				Designated		Unrestricted		(f) TOTALS
(a) Account Code									
(b) Account Amount									
(d) Total (or Planned)									
(e) Variance from Budgeted Amounts									

STEP 1

Using a blank form of Worksheet 4A, identify all of the unit's accounts, including those representing institutionally budgeted funds, and record each account code in column (a) with the accompanying account name in column (b). The administrator should modify Worksheet 4A if necessary to suit the unit's purposes. (A completed sample of Worksheet 4A is shown on the next page.)

STEP 2

Determine the degree of flexibility that the unit manager has in expending funds from each account. Record these degrees of flexibility in row (c).

Unrestricted funds are monies that the unit administrator may use for any purpose deemed necessary. Included as unrestricted funds are those monies that are institutionally restricted but that are unrestricted from the unit's perspective. For example, the donor may have stipulated to the institution that the funds are for the particular unit's use only but no other restrictions were placed on the funds. Restricted funds are given to the institution, and in turn to the unit, for a very specific purpose and must be used only for that purpose. Designated funds are unrestricted funds for which the institution's management stipulates a specific use within the unit, thereby "restricting" them as far as the unit's administration is concerned. However, the institutional management may change the designation if necessary and allow

WORKSHEET 4A-SAMPLE

UNIT ACCOUNTS

Planning Period: *Academic Year 1976*

Date: *March 30, 1975*

(a) Account Code	(b) Account Name	(c) Degree of Flexibility in Using These Accounts		
		Restricted	Designated	Unrestricted
100025	*Institutional Budget for Unit X*			
101025	*Faculty Salaries*		*$110,000*	
102025	*Staff Salaries*		*50,000*	
103025	*Equipment*		*5,000*	
104025	*Supplies and Services*		*10,000*	
105025	*Other*		*6,000*	
HC0025	*Kadac Company Fund*	*$ 7,000*		
HX1225	*Mary Deer Foundation*	*2,000*		
HR7625	*Research Project - Lin Wong*	*16,000*		
HR7725	*Smithsonian Fund for Research - Jane Door*	*8,000*		
HP5025	*Richard Fowler*			*$ 500*
HL0025	*Library Budget*		*2,000*	
H00025	*Unit Contingency Funds*			*3,000*
(d) Total Current Operating Funds		*$33,000*	*$183,000*	*$3,500*

the funds to be used for some other purpose. The unit may decide to choose a priority dimension (high priority, medium priority, low priority) to describe the use of each account instead of a flexibility dimension.

STEP 3

Assuming that the unit has identified a dimension in row (c) of Worksheet 4A, record the corresponding amount in the appropriate column. For example, on sample Worksheet 4A, $110,000 of Account 101025 is designated for faculty salaries from the Institutional Budget and is recorded under the column labeled "Designated.

STEP 4

After all accounts are identified and the amounts distributed, sum the totals and record in row (d) of Worksheet 4A. These figures show the total funds available within each category of managerial flexibility to support the unit's functions.

STEP 5

If desirable, the administrator may choose to identify and lump the accounts according to government grants, contract, private gifts, endowment income, and so forth. If so, a column can be inserted in the left side of Worksheet 4A to aggregate the accounts. Unless the worksheets are to be used to communicate to decision makers external to the unit, administrators will know the origin of the funds in each account and will not need to list them.

The information provided by Worksheet 4A indicates the funds available to the unit and their source (in account code).

Procedures for Examining the Uses or Assignments of the Unit's Funds

STEP 1 Obtain from Worksheet 4A the information regarding the unit's account codes with related amounts and transcribe them to a blank form of Worksheet 4B in rows (a) and (b) respectively according to degree of managerial flexibility. (Examples of Worksheet 4B are shown on the next two pages.)

STEP 2 Determine the categories to be used in analyzing the uses of the units funds. (Sample 1 of Worksheet 4B illustrates uses by functional category, while Sample 2 of Worksheet 4B illustrates object of expenditures categories.) List the selected use categories in column (c).

STEP 3 Distribute the amount expended from each account (or planned for future expenditure) across the use categories in the appropriate column. In the example, the $7,000 of Account HC0025 has been distributed to Public Service as stipulated by the donor.

WORKSHEET 4B-SAMPLE 1

USES OF FUNDS-BY FUNCTIONAL CATEGORY

Planning Period: *Academic Year 1975/6*

Date: *April 15, 1975*

(c) Uses of Funds		Restricted				Designated		Unrestricted		(f) TOTALS
	(a) Account Code	HC0025	HX1225	HR7625	HR7725	100025	HL0025	HP5025	H00025	
	(b) Account Amount	7,000	2,000	16,000	8,000	181,000	2,000	500	3,000	219,500
Instruction						100,000	500			100,500
Research				16,000	6,000	25,000				47,000
Public Service		6,000				15,000				21,000
Administrative Duties						14,000				14,000
Student Advising						20,000				20,000
Institutional Committee Work						7,000				7,000
Renewal and Replacement of Physical Resources						1,000		250		1,250
Scholarships & Fellowships			2,000		2,000	2,000				6,000
(d) Total (or Planned)		6,000	2,000	16,000	8,000	184,000	500	250	0	216,750
(e) Variance from Budgeted Amounts		1,000	0	0	0	(3,000)	1,500	250	3,000	2,750

*Figures in brackets ( ) indicate that the account is overspent by that amount.

WORKSHEET 4B-SAMPLE 2

USES OF FUNDS-BY OBJECT OF EXPENDITURES CATEGORY

Planning Period: *Academic Year 1975/6*

Date: *April 15, 1975*

(c) Uses of Funds		Restricted				Designated		Unrestricted		(f) TOTALS
	(a) Account Code	HC0025	HX1225	HR7625	HR7725	100025	HL0025	HP5025	H00025	
	(b) Account Amount	7,000	2,000	16,000	8,000	181,000	2,000	500	3,000	219,500
Faculty Compensation		3,000		12,000	4,000	126,700				145,700
Staff Compensation		500		2,000		39,100				41,600
Travel		2,000			1,000	1,500				4,500
Equipment						7,000				7,000
Supplies		500			500	3,700	500			5,200
Services				1,000		3,000		250		4,250
Office Expense				1,000	500	1,000				2,500
Miscellaneous			2,000		2,000	2,000				6,000
(d) Total (or Planned)		6,000	2,000	16,000	8,000	184,000	500	250	0	216,750
(e) Variance from Budgeted Amounts		1,000	0	0	0	(3,000)	1,500	250	3,000	2,750

*Figures in brackets ( ) indicate that the account is overspent by that account.

STEP 4

After the funds from all accounts have been distributed, sum the amounts for each account and record in row (d), Total (or Planned) Expenditures. In planning for future expenditures, Total Expenditures in row (d) can be replaced by "Planned Expenditures."

STEP 5

For each amount in row (d), compare it with the corresponding amount in row (b), to determine the amount of variance between the funds available in each account and the amount the unit expended from the account (or for future planning, the variance between planned expenditures and available resources). Record the respective variance in row (e).

For future planning purposes, given the overall picture of the planned uses of the unit's accounts, the administrator may want to make tradeoffs among the uses until an acceptable spending pattern is obtained.

STEP 6

When the administrator is satisfied, recalculate the amounts in the columns and update rows (d) and (e). In addition, sum the total (or planned) expenditures for each of the uses and record the total in column (f), Totals.

The administrator now has a current picture of the uses (or planned uses) of the unit's funds. In the case of planned uses, external or internal forces invariably will

change some of the amounts and distributions before the unit even uses them. However, any adjustments can be reflected and updated on Worksheet 4B.

Potential Uses of the Financial Information

Worksheet 4B (or a modified version) can be used to provide information for addressing several planning and management issues. One use is to reflect historical data about where funds were used. For example, the administrator might be interested in analyzing how the funds of each account were spent during the term just completed. Worksheet 4B can be used to record these expenditures and provide information about the particular areas of use that are of interest to the administrator.

Another use is for providing information for planning future periods. Take the case of "soft money" (funds for which the existence and/amount are relatively uncertain in the long run). A large portion of what would ordinarily be classified as soft money is restricted funds. The worksheets enable the user to trace the sources of soft money and to gain insight into the impact that a potential loss of soft money would have upon particular activities of the unit. For example, federal research monies (restricted) are usually considered "soft." Worksheet 4B can be used to examine the monies that are supporting activities involving tenured faculty within the unit. By referring back to Worksheet 4A, the particular accounts that would be impacted by possible changes in soft money funding can be determined and such an awareness would allow for contingency planning.

Finally, Worksheet 4B can provide information useful for aiding the unit's fund-raising efforts. It can show those areas where additional funds are needed to carry out functions, that is, where "holes" in funding exist. By communicating to prospective donors where funds are most needed and by providing information on the sources of funding currently available (or unavailable), donations might be channeled more effectively to those needs that are most important to the unit.

Needless to say, there are other situations in which the worksheets in this module can provide information useful to the administrator. The worksheets and procedures should be modified to meet the unit's needs for communication and analyses.

MODULE 5

IDENTIFYING AND ASSESSING OUTCOMES

((5) OUTCOMES MODULE)

Introduction

In order to determine a unit's intended accomplishments or how well a unit is operated, there is a growing need to specify goals and objectives for the unit's functions and assess the success of their achievement. The primary impetus for this awareness is that those administrators who are able to identify and articulate their unit's goals and objectives and to demonstrate the effective use of resources in achieving goals and objectives may find themselves in a better position to plan their functions in the future.

While most academic unit administrators recognize the importance of setting goals and objectives and assessing how well they have been achieved, they are cognizant also of the difficulties associated with these tasks. One of the difficulties in this area is the sensitive and fundamental task of translating goals and objectives into specific, quantifiable outcomes terms, that is, identifying those measurable or observable outcomes (products, events, conditions) that adequately reflect the goals and objectives of an academic unit's functions. A related difficulty is that groups of constituents and participants usually view outcomes from their own perspective: students may value satisfaction with the course content, completion of a degree program, or obtaining a job as outcomes of their efforts; faculty may be most concerned with professional development outcomes; and institutional planners

may view outcomes in terms of the number of credit hours produced and the amount of resources expended by the unit. Another major difficulty in assessing goals and objectives is the lack of adequate methods for obtaining and analyzing outcome and related data.

Obviously, the identification and assessment of outcomes is not done in isolation, for there are other information items and processes that must be considered. The type and level of activities to be carried on within a function as well as the quality and quantity of resources to be utilized by an activity may influence or be influenced by the outcomes to be attained.

This module provides a set of worksheets and procedures that are intended as an initial step forward in helping administrators deal with the tasks of: (1) translating broadly stated goals and objectives into specific planned outcomes terms, and (2) assessing the extent to which the planned outcomes have been achieved. By using this module, it is anticipated that academic unit administrators will be able to understand more definitively the inter-relationships among the resources to be expended, the type and level of operations to be conducted, and the outcomes to be achieved.

Worksheets Provided

The worksheets in this module are intended to help identify and articulate the planned outcomes of a unit's functions and to assess the difference between planned and actual outcomes. The worksheets (blank forms can be found on the next two pages) are:

WORKSHEET 5A

PLANNED OUTCOMES IDENTIFICATION

Function: _____

Planning Period: _____

Outcome Variables	Outcome Measures

WORKSHEET 5B

OUTCOMES PROFILE

Function: _____

Planning Period: _____

OUTCOME VARIABLE: _____	(a) Planned	(b) Actual	(c)=(b)÷(a) Profile Score
OUTCOME VARIABLE: _____			
OUTCOME VARIABLE: _____			

Worksheet 5A: Planned Outcomes Identificatcn

This worksheet provides a format for organizing and displaying the planned outcomes identified for a function. It serves as a means by which members of an academic unit may "pool" their judgments to plan the outcomes of the function or group of similar functions.

Worksheet 5B: Outcomes Profile

This worksheet can be used in assessing the degree to which planned outcomes for a function or group of similar functions (undergraduate program, graduate program, all committee work, or the entire research program) were achieved (based on criteria established by the unit). It provides reference points from which the differences between planned and actual outcomes can be analyzed.

Procedures for Translating Goals into Planned Outcomes

The major shortcoming of most stated goals is that they are not in very specific or measurable terms. As a result, it is most difficult to identify and determine the planned outcomes necessary to achieve those goals. The procedures that follow are designed to assist in the task of translating broad and generally stated goals into specific and measurable planned outcomes.

STEP 1 Identify the function and the goals for which planned outcomes are to be identified.

STEP 2

Determine which outcome variables* in the Inventory of Higher Education Outcome Variables and Measures (presented in Appendix E) are representative of each goal statement.

For example, consider the following goal:

Goal: "To develop the growth potential of each student in History 625."

Clearly, this statement does not offer much information about the specific outcomes that should result from activities implemented to attain it. Through the use of the Inventory, however, the following "Student Growth and Development" outcomes variables could be identified as reflecting the meaning of the goal:

Goal: "To develop the growth potential of each student in History 625."

Outcome Variables
- General Knowledge
- Knowledge in Specialized Fields
- Application of Knowledge
- Vocational Preparation

*An outcome variable in the context of the Inventory is defined as some entity or quality capable of assuming one of a number of quantitative and qualitative values. For each outcome variable, the Inventory presents a definition and/or pertinent description, and it suggests a list of potential measures that can provide the appropriate data for assessing the designated variables.

STEP 3

For each of the outcome variables identified, use the Inventory again to select the outcome measures or indicators that will provide quantitative information necessary for evaluating each outcome variable (a sample of Worksheet 5A is shown on page 133).

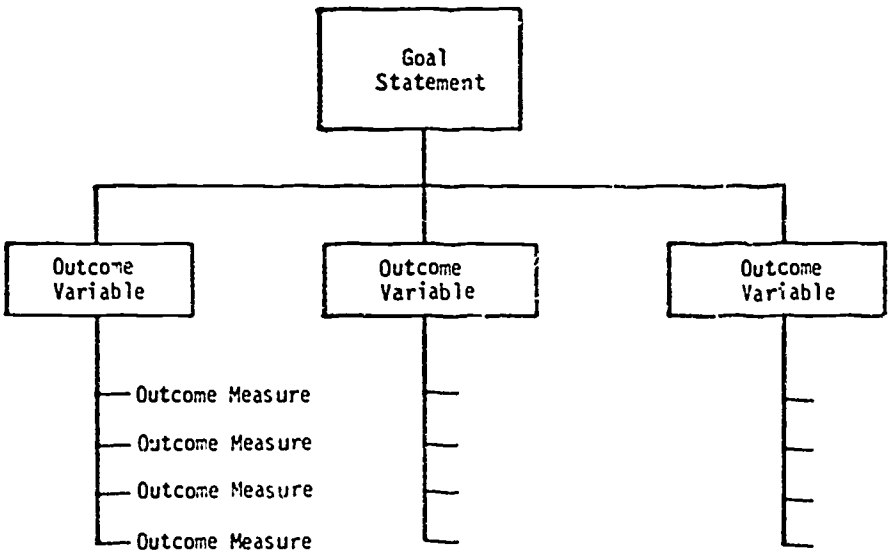
If a representative outcome measure cannot be identified in the Inventory, then substitute some other proxy measure that can be determined by the academic unit.

It is suggested that faculty and staff members associated or familiar with each function help in making the decisions about the outcome variables and measures that are most appropriate for a particular goal.

As Figure 8 shows, a single goal statement typically will be reflected in a number of different outcome variables with several outcome measures associated with each.

FIGURE 8

THE RELATIONSHIPS AMONG GOAL STATEMENT, OUTCOME VARIABLES, AND OUTCOME MEASURES



STEP 4

Record the outcome variables and associated measures identified for each function on a blank Worksheet 5A and submit it to staff committee or some other advisory mechanism for review and approval. Some factors to be considered in the review are the relevance of the variables and associated measures, and the reliability, validity, cost, and ease of administration of the procedures for obtaining the data necessary to derive each of the selected outcome measures.

WORKSHEET 5A-SAMPLE

PLANNED OUTCOMES IDENTIFICATION

Function: *History 625*

Planning Period: *Fall 1975*

Outcome Variables	Outcome Measures
Academic Preparation: *The ability to seek, gain, and maintain a particular level and kind of academic pursuit.*	*--Percentage of department majors completing the course* *--Percentage of majors from other departments completing the course*
Specialized Knowledge: *The familiarity with and understanding of facts and principles in the particular field in which the student elects to study. The student's depth of knowledge.*	*--Average student-reported score on a scale measuring degree of satisfaction with knowledge gained in course (based on student evaluation of course and instructor)* *--Average instructor-evaluation score on a scale measuring degree to which students have satisfied course objectives set by instructor*
Application of Knowledge Skills: *The ability to relate relevant general or specialized knowledge to a problem and to implement a solution. Also, the ability to locate, retain, and filter relevant knowledge.*	*--Average student change in ability to apply knowledge gained in course as determined by pre- versus post-test comparisons*

STEP 5

Once the outcome variables and measures for each function are confirmed, the different versions of Worksheet 5A can be organized into an "outcome variables and measures inventory." In turn, this set of worksheets can be used as a basis for planning, management, and assessment purposes. Furthermore, the worksheets can be used as a vehicle for communicating the planned outcomes among administrators, faculty, and other persons responsible for or involved with the unit's functions.

Procedures for Assessing Planned Versus Actual Outcomes

Once the outcome variables and measures are identified for each function, it becomes possible to make some comparisons between planned and actual outcomes. The following set of procedures used in conjunction with Worksheet 5B are intended to provide an initial step toward the assessment of outcomes.

STEP 1

Identify the function to be evaluated.

STEP 2

Using a blank Worksheet 5B, identify and record the outcome variables and their associated measures. The inventory of Worksheet 5A developed with the previous set of procedures can be used to assist in this step. (Examples of completed Worksheets 5B are shown on the next two pages. Note that Sample 2 illustrates a grouping of similar functions, the History Graduate Program.)

WORKSHEET 5B-SAMPLE 1

OUTCOMES PROFILE

Function: *History 625*

Planning Period: *Fall 1975*

OUTCOME VARIABLE: *Academic Preparation*	(a) Planned	(b) Actual	(c)=(b)÷(a) Profile Score
Outcome Measures:			
--Number of department majors completing the course	*75*	*50*	*.67*
--Number of majors from other departments completing the course	*20*	*30*	*1.50*
OUTCOME VARIABLE: *Specialized Knowledge*			
Outcome Measures:			
--Average student-reported score on a scale measuring degree of satisfaction with knowledge gained in course (based on student evaluation of course and instructor)	*90*	*80*	*.89*
--Average instructor-evaluation score on a scale measuring degree to which students have satisfied course objectives set by instructor	*80*	*85*	*1.06*
OUTCOME VARIABLE: *Application of Knowledge of Skills*			
Outcome Measures:			
--Average student change in ability to apply knowledge gained in course as determined by pre- versus post-test comparisons	*50*	*62*	*1.24*

WORKSHEET 5B-SAMPLE 2

OUTCOMES PROFILE

Function: *History - Graduate Program*

Planning Period: *Academic Year 1974-75*

OUTCOME VARIABLE: *Academic Preparation*	(a) Planned	(b) Actual	(c)=(b)÷(a) Profile Score
--Number of students graduating from the institution after 2 years as percentage of the entering cohort	90	81	.90
--Number of graduates who transferred in as a percentage of total graduates for the year	60	75	1.25
OUTCOME VARIABLE: *Vocational Preparation*			
--Percentage of graduates employed within 3 months after graduation	80	90	1.125
--Average first salary of graduates	12,000	11,500	.958
--Percentage of total graduates employed in-state versus out-of-state	40	50	1.250
OUTCOME VARIABLE: *Discovery of New Knowledge*			
--Average percentage of faculty time spent in selected basic research activities	25	20	.80
--Total dollar amount of gifts and/or grants received for the development of new ideas and products without concern for practicality as a percentage of the annual total budget	10	12	1.20

STEP 3

The next step is to identify the evaluation criteria or the levels of performance, that is, the "planned" outcome against which the "actual" outcome can be compared.

Generally, three types of comparisons can be made. First, an actual outcome can be compared to some "absolute" standard or goal that has been set for the specific level or degree of performance to be achieved. Such standards usually specify the particular minimum and/or maximum levels of performance to be achieved. It is possible also to use a historical outcomes data base as a basis for comparison. Often it is of interest to know how an activity has done relative to its past performance. This means establishing a data base that can be maintained and utilized for making evaluations over designated periods of time. A third possibility is to use the performance of comparable functions.

STEP 4

At the appropriate times, determine and record in column (b) the actual outcome for each of the outcome measures. A comparison now can be made between the actual and planned outcomes to determine the differences. Attempt to discover the reasons for the differences if they appear to be significant.

STEP 5

Calculate the Profile Score for each outcome measure by dividing the amount in the Actual column by the amount in the Planned column [column (c) = column (b) ÷ column (a)] and record in column (c). The interpretation and use of the profile score is left to the user. One use is to compare it with a representative profile score. For example, on Sample 1 Worksheet 5B, a representative profile score for "the number of department majors completing the course" may have been .80. Thus, the .67 profile score that was actually attained seems to indicate that the function did not fare as well as expected (for whatever reasons) for that particular outcome.

Potential Uses of Outcomes Information

To reiterate, information about outcomes can be used in several ways. First, outcomes information can be used in the goal-setting or objectives-setting process of the unit. Needless to say, translating goals into planned outcomes can bring a common understanding of what is to be accomplished in the unit and also may serve as a potential means to determine the effectiveness with which a function is contributing to the educational process.

Second, in the process of identifying and assessing outcomes, the interrelationships among the resources to be utilized, operations to be conducted, and outcomes to be achieved could become more clarified. While causal relationships are not evident, attempts can be made intuitively to describe the effects of different types and uses of resources and different types and levels of activity upon planned outcomes, thus facilitating the investigation of planning and management alternatives.

Finally, outcomes information can enhance communication about the unit's scope and direction to interested constituents and to those whose support the unit wants to retain.

In summary, this module represents only the beginning of NCHEMS's effort to help academic unit administrators obtain a better understanding of the outcomes of the educational process that occur within their academic unit. At NCHEMS, the Outcomes of Postsecondary Education project is continuing to consider the whole spectrum of the characteristics, uses, and implications of the outcomes of institutions and their programs. Several related documents have been or are being produced:

The Higher Education Outcome Measures Identification Study (Micek and Arney, 1974) summarizes the outcomes information needed by institutional and state administrators for decision making.

An Inventory of Institutional Environmental Variables and Measures (Micek and Service, in draft form) looks at process and environmental measures influencing outcomes.

An Introduction to the Identification and Use of Higher Education Outcome Information, Technical Report #40 (Micek and Wallhaus, 1973) includes a taxonomy of outcomes plus associated indicators and suggests a preliminary strategy for using the taxonomy to translate general goals into specific outcomes. An overview and the inventory of outcomes and potential indicators are provided in Appendix E of this Academic Unit Planning Manual.

Outcome Measures and Procedures Manual (Micek, Service, and Lee, forthcoming in 1975) consists of procedures to obtain and use outcomes information in the planning process.

A Structure for the Outcomes of Postsecondary Education (Lenning, forthcoming in 1975) describes a framework for organizing outcomes information for purposes of retrieval, analysis, and communication uses in planning and management.

Those interested in keeping abreast of these developments should contact the staff of the NCHEMS's Outcomes of Postsecondary Education project.

APPENDICES

APPENDIX A

CONTRIBUTIONS OF NCHEMS PRODUCTS TO THE ACADEMIC UNIT PLANNING MANUAL

NCHEMS PRODUCT	CONTRIBUTION
An Introduction to the Identification and Use of Higher Education Outcome Information (Micek and Wallhaus, 1973)	Inventory of outcome variables measures
Faculty Activity Analysis: Procedures Manual (Manning and Romney, 1973)	Faculty activity categories
Higher Education Finance Manual (Field Review Edition) (Collier, 1974)	The source/use concept of the flow of current operating funds
Higher Education Program Assessment Profiles (Wallhaus and Micek, 1972)	Procedures for assessing outcomes of institutional activities
Induced Course Load Matrix Generator: Systems Documentation (Haight and Manning, 1972)	Concepts of the Induced Course Load Matrix and Instructional Work Load Matrix
Program Classification Structure: First Edition (Gulko, 1972)	A program-oriented structure for organizing institutional activities
Program Measures (Topping and Miyataki, 1973)	Information categories for describing activities
Student Data Module Reference Manual (Haight and Martin, forthcoming in 1975)	Concepts of contribution and consumption information regarding student enrollments.

APPENDIX B

BRIEF DESCRIPTION OF

THE NCHEMS PROGRAM CLASSIFICATION STRUCTURE (GULKO, 1972)

NCHEMS PROGRAM CLASSIFICATION STRUCTURE*

The Program Classification Structure provides "a consistent means of identifying and organizing the activities of higher education institutions in a program-oriented manner" (Gulko, 1972:1). It focuses upon the outcomes of various activities and organizes the activities according to outcomes that are similar in primary intent. For example, Figure B.0 indicates institutional programs and subprograms. A description of each program and subprogram follows:

*The Program Classification Structure reflects revisions that have been adopted and are being prepared for publication in Summer 1975.

FIGURE B.0

ORGANIZATION OF THE
PROGRAM CLASSIFICATION STRUCTURE
(REVISED)

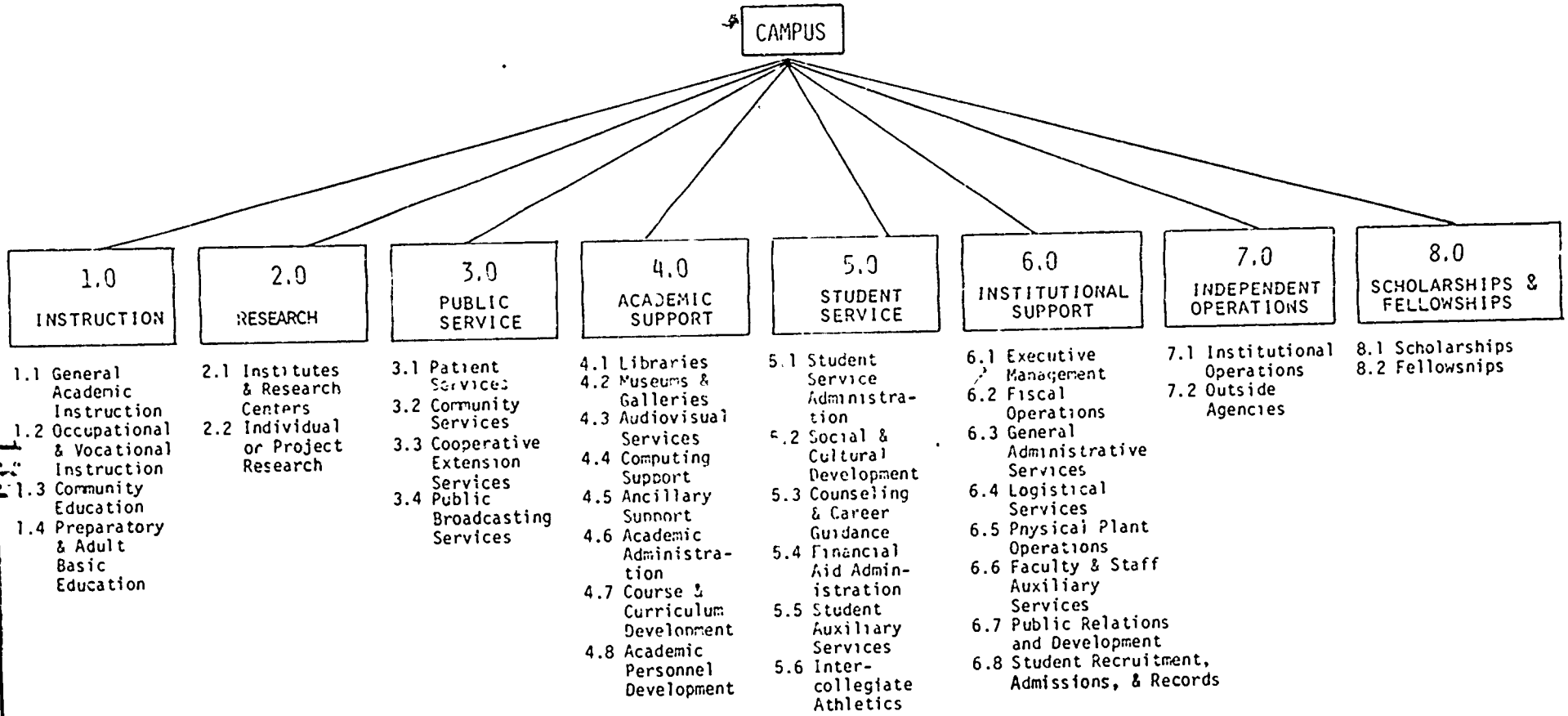
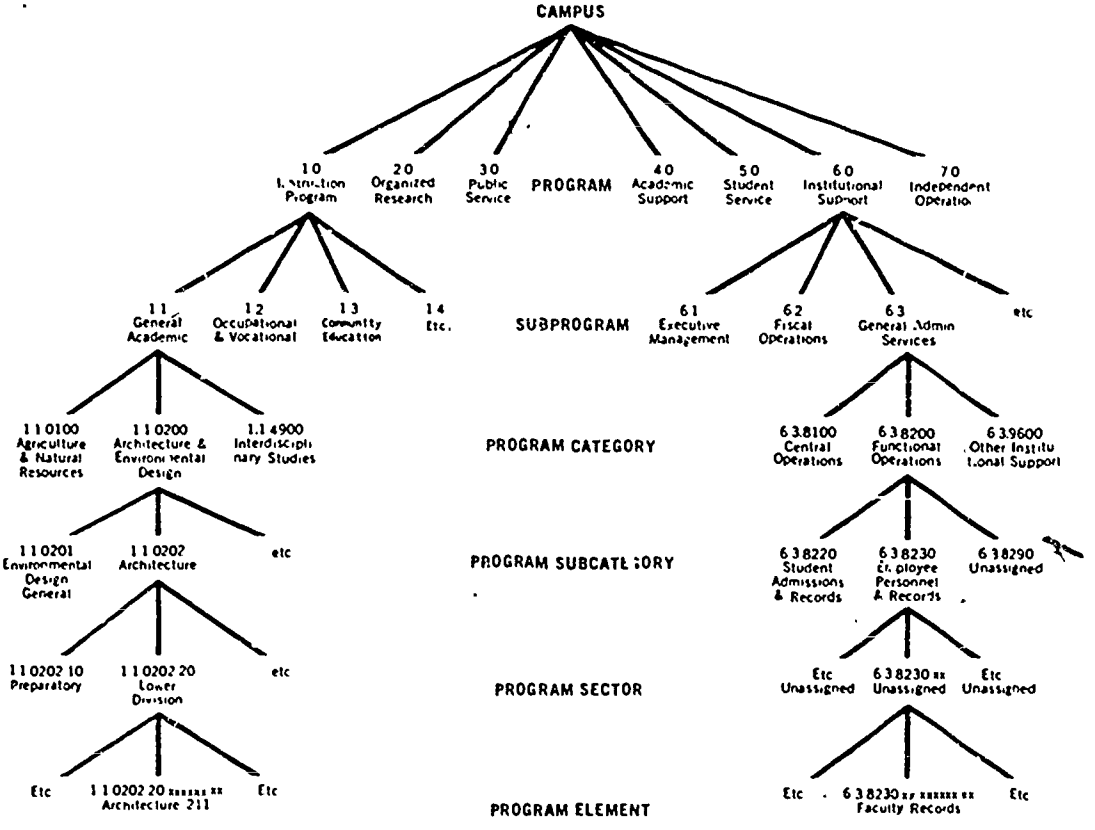


FIGURE B.1

PROGRAM CLASSIFICATION STRUCTURE NOMENCLATURE AND DESCRIPTIONS



Descriptions:

Campus-Highest level of aggregation.

Program-The collection of program elements serving a common set of objectives that reflect the major institutional missions and related support objectives.

Subprogram-An aggregation level that structures program categories into subsets of the major missions of the institution.

Program Category-An aggregation of program elements that may be used to sum related program elements across program lines.

Program Subcategory-A collection of homogeneous program elements comprising a subdivision of a program category that classifies program elements relative to their academic discipline or functional purpose.

Program Sector-Refers to a subgrouping of program elements within a subcategory, e.g., level of course.

Program Element-The smallest unique collection of managed resources that are output producing activities, i.e., a collection of resources, technologies, policies that through their integrated operations, produce goods or services that are of value to the organization because they contribute to the achievement of an institutional objective.

1.0 Instruction Program

The instruction program consists of all formal educational activities. These activities include both those in which a student engages to earn credit toward a degree or certificate and those offered as community education for which no credit is earned. The instruction program consists of the following four subprograms:

General Academic Instruction (subprogram 1.1) includes those instructional program elements operating during the academic year (as defined by the institution) that are part of a formal degree or certificate curriculum and are managed by the regular academic departments as well as other organizational units, e.g., a summer school division or an extension division.

Occupational and Vocational Instruction (subprogram 1.2) includes those program elements established primarily to provide instruction in disciplines usually associated with HEGIS discipline categories 5000 through 5500. This subprogram is intended primarily for use by institutions offering two-year (or less) degree/certificate programs for vocational certification in the trades and paraprofessional areas.

Community Education (subprogram 1.3) includes those instructional program elements that provide noncredit services, both on or off campus, which may be taken by either matriculated students or members of the general community. Any program elements that produce credit toward the high school diploma should be included in 1.4, Preparatory and Adult Basic Education.

Preparatory and Adult Basic Education (subprogram 1.4) includes those instructional program elements intended to give students the basic knowledge and skills they need in preparation for formal academic course work leading to a degree or certificate. Also includes program elements that offer courses required to fulfill a standard requirement, e.g., high school completion prior to beginning work on a postsecondary degree or certificate.

2.0 Organized Research Program

The organized research program comprises all research-related program elements established within the institution under the terms of agreement with agencies external to the institution or separately budgeted and conducted with internal funds. Organized research consists of the following two subprograms:

Institutes and Research Centers (subprogram 2.1) contains all research-related program elements that are part of a formal research organization. Federally funded research centers should be excluded here and placed under subprogram 7.2.

Individual or Project Research (subprogram 2.2) contains the research program elements that are normally managed within the academic departments. This subprogram consists of the various research-related program elements that have been created as a result of a contract, grant, or specific allocation of institutional resources to conduct a study or investigation of a specific scope.

3.0 Public Service Program

The public service program contains the program elements within the institution that produce outcomes directed toward the benefit of the community of individuals residing within the geographic service area of the institution. This program consists of the following four subprograms:

Patient Services (subprogram 3.1) consists of those program elements that benefit patients directly through faculty physicians or indirectly through consulting, laboratory, or other services usually rendered under the auspices of a hospital or clinic. These program elements are intended to serve the community-at-large although students, faculty, and staff also may derive benefits from those services.

Community Services (subprogram 3.2) are those program elements that have been established to provide general community services, excluding instructional activities. Community service is concerned with making available to the public various resources and unique capabilities that exist within the institution.

Cooperative Extension Services (subprogram 3.3) is a separate subprogram to accommodate the program elements that are established as the result of cooperative extension efforts between the institution and outside agencies, e.g., agriculture extension, urban extension. This subprogram is intended primarily for land grant colleges and universities. The distinguishing feature of program elements in subprogram 3.3 is that the programmatic and fiscal control is shared by the institution with one or more governmental units.

Public Broadcasting Services (subprogram 3.4) includes those program elements associated with the operation and maintenance of broadcasting services that primarily support the instruction program or represent independent operations.

4.0 Academic Support Program

The academic support program contains those program elements that support one primary program through retention, preservation, and display of materials or provide services that directly assist the academic functions of the institution. The academic support program consists of the following seven subprograms.

Libraries (subprogram 4.1) consists of all activities that directly support the operation of cataloged or otherwise classified collection of published material. Program categories within the library subprogram normally will be separate library entities such as the law library, the engineering library, etc.

Museums and Galleries (subprogram 4.2) includes all program elements established to provide services related to the collection, preservation, and exhibition of historical materials, art objects, scientific displays, etc. Other program elements that may exist for the purpose of collection, preservation, and exhibition should be included within this subprogram, e.g., an arboretum. Libraries are excluded.

Audiovisual Services (subprogram 4.3) is all program elements associated with providing audio and/or visual materials or media services to support the primary programs. Program elements are normally organizational units established to provide audiovisual service to a particular sector of the institution.

Computing Support (subprogram 4.4) contains those program elements that have been established to provide computing support to the primary programs. Excluded from this subprogram is administrative data processing, which is included as part of the institutional support program (6.0).

Ancillary Support (subprogram 4.5) is program elements that provide support services to the primary programs and are not appropriately classified within the previous subprograms. Such ancillary support activities, when they exist, normally provide joint services to the instruction, organized research, and public service programs. Examples of ancillary support include teaching hospitals, demonstration schools, and such special functions as a glass blowing shop.

Academic Administration (subprogram 4.6) contains the program elements that provide administrative support and management direction for the primary programs. The intent of this subprogram is to provide a well-defined identification of the management function in the primary programs.

Course and Curriculum Development (subprogram 4.7) is a subprogram that identifies those program elements established to accomplish the planning and developmental activities for future (i.e., subsequent to the current budget period) program elements in the primary programs.

Academic Personnel Development (subprogram 4.8) is a subprogram that provides the faculty with opportunities for increasing their personal and professional growth and development that evaluate and reward their professional performance.

5.0 Student Service Program

The student service program comprises all program elements related to the institution's student body, excluding the degree-related activities and student records. Within the student service program are the following five subprograms:

Student Service Administration (subprogram 5.1) contains those central administrative program elements that serve the full range of student support programs, e.g., Dean of Men, Dean of Student Personnel Services, Dean of Women, Dean of Students. Administrative program elements that relate to a single support program are excluded, e.g., the Director of Residence Halls.

Social and Cultural Development (subprogram 5.2) is those program elements that have been established to provide for the student's social and cultural development outside of the degree curriculum.

Counseling and Career Guidance (subprogram 5.3) contains program elements established to provide counseling services, career guidance, and placement services for the student body. Excluded from this subprogram is informal academic counseling provided by the faculty in relation to course assignments.

Financial Aid Administration (subprogram 5.4) consists of program elements established to provide financial aid services and assistance to students.

Student Auxiliary Services (subprogram 5.5) contains elements established within the institution to provide convenience services to the student body or services to special student groups. For many institutions, it often will be difficult to discriminate between convenience services provided for the benefit of students and those provided for faculty and staff, e.g., a central cafeteria for both. In such instances, the program element typically will be identified to the student support subprogram unless the primary intent is clearly to provide services for the faculty and staff.

Intercollegiate Athletics (subprogram 5.6) contains all program elements related to the participation of the institution in athletic activities with other colleges and universities. The office and staff of the athletic director would be included here.

6.0 Institutional Support Program

The institutional support program consists of those activities within the institution that provide campuswide support to the other programs. These program elements have been classified into the following seven subprograms:

Executive Management (subprogram 6.1) consists of all central executive-level program elements and other program elements concerned with the management and long-range planning of the entire institution, as contrasted to any one program within the institution. Included within this subprogram are such central operations as legal services and executive direction, which consists of the governing board, the chief executive officer, and the senior executive officers (e.g., the vice-president).

Fiscal Operations (subprogram 6.2) includes those central operations related to fiscal control, investments, and functional program elements related to the fiscal operations of the institution.

General Administrative Services (subprogram 6.3) includes program elements that provide central administrative services to the institutional support program (e.g., administrative data processing) and functional program elements related to student records and staff personnel.

Logistical Services (subprogram 6.4) contains program elements that provide procurement services, supply and maintenance of provisions, and the orderly movement of support materials for the campus operation. Included within logistical services are central program elements related to the environmental health and safety of the staff and students.

Physical Plant Operations (subprogram 6.5) are those program elements established to provide services related to the campus grounds and facilities.

Faculty and Staff Auxiliary Services (subprogram 6.6) includes the program elements established to provide support services for the faculty and staff.

Public Relations and Development (subprogram 6.7) are those program elements that have been established to maintain relationships with the general community, the institution's alumni, or other constituents, and to conduct activities related to development and fund raising. Excluded from this subprogram are the program elements established primarily to provide public service to the community.

Student Recruitment, Admissions, and Records (subprogram 6.8) consists of those program elements related to the recruitment of new students, the student admissions process, and the administration of student records. For proprietary institutions, this subprogram also includes all activities related to sales operations, advertising, and marketing.

7.0 Independent Operations Program

The independent operations program provides the capability to classify those program elements that are independent of, or unrelated to, the primary missions of the institution. The independent operations program consists of two subprograms:

Institutional Operations (subprogram 7.1) are those program elements that represent operations owned or controlled by the institution and are foreign to, or independent of, the institution's mission: e.g., the operation of commercial rental property for income, a restaurant, a bowling alley.

Outside Agencies (subprogram 7.2) are those program elements that are controlled or operated by outside agencies but are housed or otherwise supported by the institution. An example would be the Western Interstate Commission for Higher Education, which has its offices on the campus of the University of Colorado.

8.0 Scholarships and Fellowships Program

The scholarships and fellowships program provides the capability to classify and include funds awarded to graduate and undergraduate students. This program consists of two programs:

Scholarships (subprogram 8.1) includes funds awarded to undergraduate students as grants-in-aid, trainee stipends, tuition and fee waivers, and prizes.

Fellowships (subprogram 8.2) includes funds for graduate students as outright grants-in-aid and trainee stipends. Excluded are funds for which services to the institution must be rendered, e.g., teaching and research assistants.

APPENDIX C

BRIEF DESCRIPTION OF PROGRAM MEASURES
(Topping and Miyataki, 1973)

PROGRAM MEASURES

A program structure alone is not sufficient to assist in the planning and budgeting of academic unit activities without knowing its contents. Items of information are needed to describe or tell something about each element within the structure. For example, just to know the name of an instructional activity such as an undergraduate history course is not enough. The contents of the course must be identified: the number of enrollments, the faculty member assigned to teach the course, the method of teaching, the number of completers, etc. The categories of information describing each program element have been adapted from the NCHEMS Program Measures document and are referred to as *program measures*.

The measures associated with a program element are identified in Figure C.0. and described below:

FIGURE C.0: MEASURES ASSOCIATED WITH A PROGRAM ELEMENT

PROGRAM ELEMENT	Target and Beneficiary Group Measures	Resource Measures	Activity Measures	Financial Measures	Outcome Measures

Target and Beneficiary Group Measures identify and quantitatively describe the people or groups of people to be served by and/or who will benefit directly or indirectly from either the activities or outcomes of a program element

during a stated time period. Those to be served are known as target groups and those who will benefit are called beneficiary groups.

Resource Measures quantitatively express the physical and human resources to be utilized within a program element during a stated time period. Physical resource measures pertain to facilities, equipment, supplies, and services, while human resource measures refer to faculty and staff.

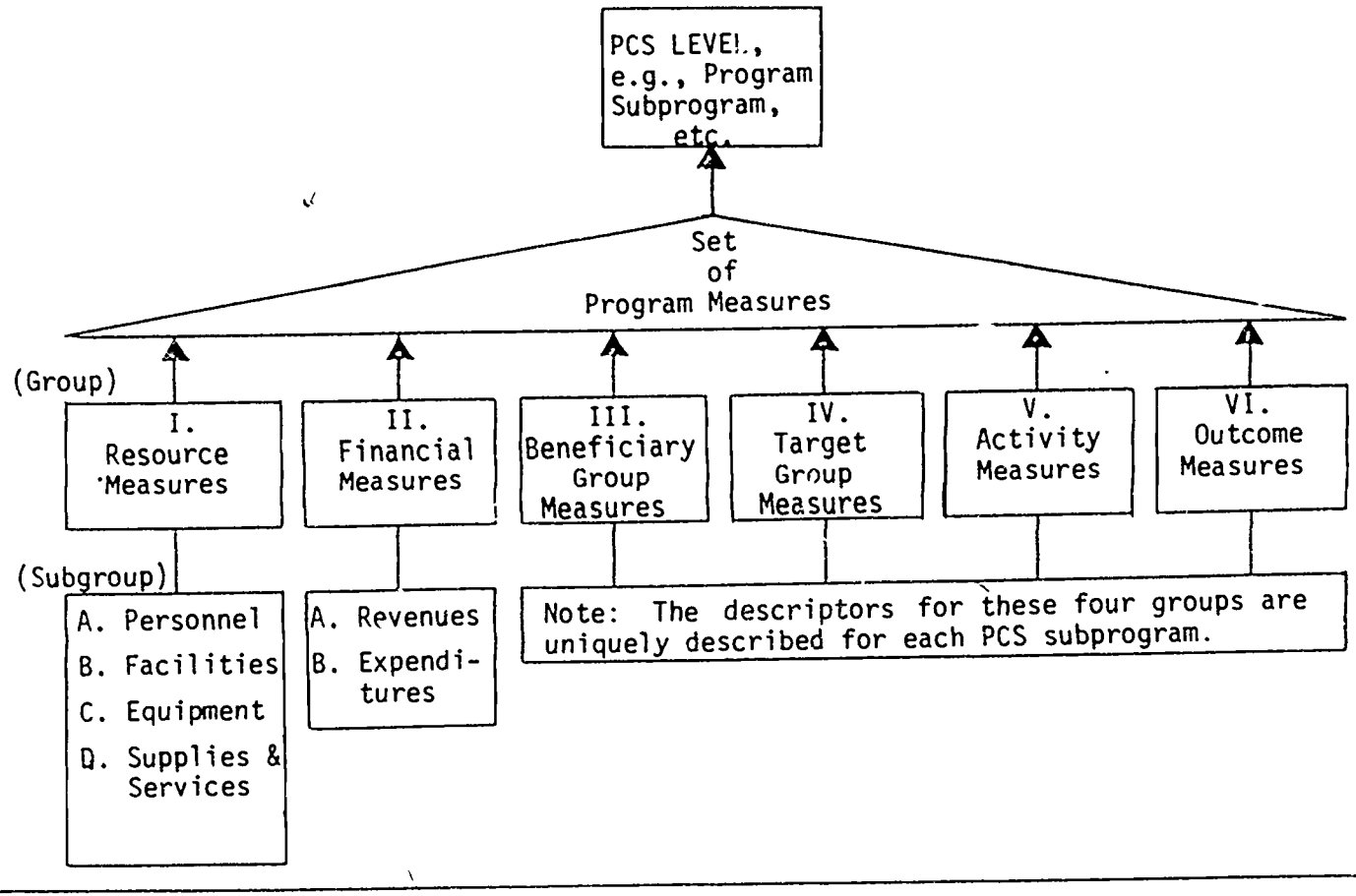
Activity Measures quantitatively express the level and type of operations to be carried on within a program element during a stated time period. These measures help to describe the process of a program element.

Financial Measures quantitatively express in dollar amounts the source of funds and expenditures for physical and human resources to be spent at a specific level of activity within a program element during a stated time period.

Outcome Measures quantitatively express the outcomes achieved or the products to be generated by the activities of a program element during a stated time period. These measures also enable the administrator to evaluate the degree to which the outcomes met the objectives of the program element. What did the money buy?

Each of these program measure categories is called a *group*. The participant measures, resource measures, and financial measures groups are broken down into *subgroups*. For example, the resource measures group consists of facilities, equipment, and supplies and services subgroups. Each of these subgroups consists of the specific *categories* that can be used to describe or measure a particular aspect of each program element. The activity or outcomes measures groups are not subdivided into subgroups; instead, the categories are grouped into an inventory from which they can be individually selected to describe each program element. Figure C.1 illustrates the nomenclature or framework of program measures.

Figure C.1: GENERAL FRAMEWORK OF PROGRAM MEASURES



APPENDIX D

INSTRUCTIONS FOR COMPLETING

WORKSHEET 3B: FACULTY PLANNING FORM

Instructions for Completing Worksheet 3B: Faculty Planning Form

(a) Faculty Data: Complete this block by filling in your name, identifiers that describe some key characteristics about yourself, and the academic year for which the information is being obtained. (Can be filled in by the administrator before being sent to each faculty member.)

(b) Overall Comments Regarding Plans for the Next 2-3 Years: In a brief paragraph, give a general indication of your major plans that would influence your workload in the next 2-3 years.

(c) Faculty Workload: This block is used to indicate your workload requirements for the academic year and each term. (The unit should determine whether the course units will be reflected in equivalent course sections, clock-hours, contact hours, or whatever measure the institution uses for workload assignments.)

(d) A.1 Scheduled Teaching: The information to be completed in this section refers to the teaching workload.

List Those Courses You Can and Would Like to Teach: In this column, indicate which courses you are capable of teaching. The guidelines within which your list is drawn should be established by your unit. For example, you may have a free choice, you may select from a predetermined list indicating some "core" subjects that you are required to teach, or the list might be drawn by the administrator as a first step.

WORKSHEET 3B-SAMPLE

(a) Faculty Planning Form* Page 1 of 2

Name *Jane Doer* Department *History*

Rank *Professor* Planning Period *Academic Year 1975-76*

Teaching FTE (1.0 = Full-Time) *.33* Salary (Optional) _____

(b) Overall Comments Regarding Plans for the Next 2-3 Years:

I expect to relinquish the department head's position in academic year 1976-77 and resume a more active role in research and teaching.

(c) Faculty Workload

Academic Year		Fall		Winter		Spring	
# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct	# of Course Units You Expect to Conduct**	# of Additional Course Units You May Conduct
4	*0*	*1*	*0*	*2*	*0*	*1*	*0*

(d) A.1 Scheduled Teaching

List Those Courses You Can and Would Like to Teach		Fall			Winter			Spring		
Dept. Prefix	No.	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***	# of Course Units You Would Like to Conduct	# of Additional Course Units You May Conduct	Preference***
Hist	*100*	*0*	*1*	*2*	*0*	*0*	*0*	*0*	*1*	*2*
Hist	*410*	*1*	*0*	*3*	*1*	*0*	*3*	*0*	*0*	*3*
Hist	*570*	*0*	*1*	*3*	*0*	*1*	*3*	*0*	*1*	*3*
Hist	*625*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*5*
.	.									
.	.									
.	.									

*Adapted from Faculty Activity Analysis: Procedures Manual (Manning and Romney, 1973)

**Course Units - to be defined by the administrator. For illustration purposes, the data refer to "Course Section."

***Preference Scale:
0 - would only teach if no one else is available
1 - would not like to teach
2 - indifferent
3 - would like to teach
4 - would strongly like to teach
5 - would most like to teach

(e) Activity Category	(f) Activity Description*	(g) Estimated Average Weekly Workload**		
		Term 1	Term 2	Term 3
A.2 Unscheduled Teaching	Thesis Committee Participation	1.0	1.0	1.5
A.3 Academic Program Advising	Course Scheduling and Academic			
	Planning Consultations	3.0	2.0	2.5
A.4 Course and Curriculum Res. & Dev.	Developing Dept. Curriculum Requirements	1.5	1.0	2.0
Section B. Research, Scholarship, and Creative Work Activities				
B.1 Specific Projects	Administering Research Grants	.5	.5	1.0
	Departmental Research	.5	.5	.5
B.2 General Scholarship and Professional Development	Officer in a Professional Society	.25	.25	---
	Reading Professional Journals	2.0	3.0	1.0
Section C. Internal Service Activities				
C.1 Student-Oriented Service	Preparing Recommendations	.25	.25	.5
	Sponsoring Student Organizations	2.0	2.0	2.0
C.2 Administrative Duties	Department Administration	25.0	20.0	25.0
	Recruiting Faculty	.5	1.0	2.0
	Preparing Budgets	2.0	2.0	4.0
C.3 Committee Participation	Faculty Council	1.0	1.0	1.0
	Departmental Meetings	2.0	2.0	2.0
	Joint Budget Committee	1.0	1.5	3.0
	Facility Planning Commission	1.5	1.0	1.0
Section D Public Service Activities				
General Professional Services Directed OUTSIDE the Institution	Community Relations	3.0	3.0	3.0
	Consulting	---	2.0	---
Section E Technical Services Activities				
Technical Management and Support				
(h)	Average Weekly Hours in Addition to Teaching Activities	47.0	44.0	52.0

*These descriptions should be expressed in terms familiar to the academic unit members

**Expressed in average weekly clock-hours for illustration purposes. The academic unit should determine the measure to use

# of Course Units You Would Like to Conduct: In these columns, record the number of units of each course you would like to teach for each term. This column could be used also to reflect the number of course units you are expected to teach.

# of Additional Course Units You May Conduct: In these columns, for each term, indicate the number of additional units of each course you would be willing to conduct if a faculty member is needed to teach that course and you have the capability.

Preference: Through this measure, express the strength of your link with each course. (This measure need not be faculty preference but in fact might be determined through administrative means of assessing each member's ability to teach the course.)

(e) Activity Category: Fill in the categorical identification of the activity. (This will usually be preprinted on the form.)

(f) Activity Description: For each Activity Category, fill in a description of each activity in which you will be involved. Examples of activities in each Activity Category are:

A.2 Unscheduled Teaching. Teaching not associated with the specific courses listed in A.1. For example:

- Thesis committee participation
- Thesis advising
- Discussions with colleagues about teaching
- Guest lecturing in another faculty member's course
- Giving seminars within the institution

A.3 Academic Program Advising. Giving advice to students concerning course scheduling and academic programs. Not to be confused with counseling that is included in C.1.

A.4 Course and Curriculum Research and Development. Developing and preparing for future courses. For example:

- Preparing course outlines
- Developing book lists
- Evaluating courses
- Devising new instructional materials
- Revising existing materials
- Planning summer or intersession programs
- Developing department curriculum requirements
- Evaluating teaching effectiveness and planning changes

SECTION B: RESEARCH, SCHOLARSHIP AND CREATIVE WORK ACTIVITIES

B.1 Specific Projects. Research, scholarship, and creative work activity related to a specific project. For example:

- Departmental research
- Sponsored research
- Performing your professional skill
- Your dissertation research
- Reviewing a colleague's research work
- Writing or developing research proposals
- Administering research grants
- Giving recitals
- Maintaining an artistic skill
- Writing articles
- Writing books
- Writing reviews
- Creating new art forms
- Exhibitions

B.2 General Scholarship and Professional Development. All research, scholarship, and creative work activities related to keeping current in a professional field. For example:

- Reading articles and books related to your profession
- Officer in a professional society
- Attending professional meetings
- Attending seminars
- Research-related discussion with colleagues
- Editor of a journal

SECTION C: INTERNAL SERVICE ACTIVITIES

This section includes activities related to general contact with students, to professional responsibilities within other organizational units within the institution, and to fulfilling institutional requests.

C.1 Student-oriented Service. For example:

- Personal, career, and financial counseling
- Preparing recommendations
- Participation in social interaction
- Recruiting students
- Sponsoring student organizations
- Meeting with parents
- Attending student recitals
- Coaching intramural or intercollegiate athletics
- Directing the band, orchestra, student plays, debate team, or any other student group

C.2 Administrative Duties. For example:

- Performing the duties of a department chairman, dean, vice president, or any other administrative position
- Administering personnel policies
- Faculty service reports and questionnaires
- Keeping records
- Preparing minutes
- Writing and answering memoranda
- Assigning faculty course loads
- Preparing budgets
- Gathering data
- Helping during registration
- Interviewing candidates for faculty positions
- Escorting visitors
- Recruiting faculty
- Advising on library purchases
- Recruiting students

C.3 Committee Participation. For example:

- Admission committees
- Departmental meetings
- Faculty senate
- Planning committees
- Budget committees

SECTION D: PUBLIC SERVICE ACTIVITIES

This section includes activities that are directed outside the institution (except for those associated with community education (extension instruction) which should be included in A.1.)

Group 1 Professional Services Advice Directed Outside the Institution. Activities meant to benefit the community outside the institution. For example:

- Consulting
- Advising
- Professionally performing as in plays, orchestras
- Community training grants
- Patient care
- Lectures or seminars for the public
- Agricultural extension
- Urban extension

SECTION E: TECHNICAL SERVICES ACTIVITIES

This section includes activities related to the technical services provided by a department to support the instructional, research, and public service programs of the institution.

Technical Management and Support: For example:

- Closed-Circuit TV programming and monitoring
- Managing the institution's radio station
- Managing the technical support staff
- Maintenance of instructional equipment
- Publishing institutional newspaper

(g) Estimated Average Weekly Workload: For each of the activities you will be involved with, estimate the average weekly hours you think you will spend in that activity for each academic term.

(h) Average Weekly Workload in Addition to Teaching Activities: Sum the Estimated Average Weekly Workload for each term to get an indication of the total average weekly hours you might spend in nonteaching activities during a particular academic term.

APPENDIX E

INVENTORY OF HIGHER EDUCATION OUTCOME VARIABLES AND MEASURES

[Extracted from Micek and Wailhaus, 1973]

THE INVENTORY OF HIGHER EDUCATION

OUTCOME VARIABLES AND MEASURES: AN OVERVIEW

The Outcomes of Higher Education project of the National Center for Higher Education Magagement Systems at WICHE hopes to make significant contributions to solving the problems associated with identifying and using outcome information in planning and management. NCHEMS's first effort has been an attempt to develop an inventory of possible outcome variables with suggestions for their measurement. The sections that follow describe the inventory and its use.

Development of the Inventory

One major problem associated with incorporating the outcomes of higher education into planning and decision making processes has been the lack of a "common outcomes language" necessary for communicating and understanding the outcomes and benefits of higher education programs. To some degree this situation parallels the difficulties biologists faced prior to the development of Linnaeus's taxonomy, which provided a common language or inventory for identifying and categorizing the various hierarchies of living organisms. Once the taxonomy was completed, however, biologists were in a better position to identify, measure, and analyze the characteristics and changes of the various species. Consequently, their knowledge about plant and animal organisms increased, and their communication about these organisms with other scientists improved.

Similarly, higher education has difficulty communicating about benefits or results. Barriers are encountered when attempts are made to translate goal statements into terms of program outcomes, and program comparisons are thwarted because structures, definitions, and measures are lacking. While developing a communication base for higher education outcomes is by no means a total or final solution, it is a necessary step. Recognition of the potential benefits of such a communication base has led NCHEMS to develop the Inventory of Higher Education Outcome Variables and Measures. This inventory lists and describes various outcomes of higher education and suggests potential measures or proxy measures of those outcomes.*

Basic to the inventory are two criteria. The first criterion is that the inventories must be of service to as many kinds and levels of planners and decision makers in higher education as possible. For example, they should aid students and parents in making better decisions about which

---

*NCHEMS also has developed an Inventory of Institutional Environment Variables and Measures that includes various combinations of resource measures, financial measures, activity measures, and target and beneficiary group measures. The development of this inventory recognizes that institutions do design programs and allocate resources to produce certain important environmental outcomes. For example, institutions of higher education create programs and allocate resources to develop certain types of facilities that will promote a unique intellectual and/or social atmosphere. While the creation of this unique atmosphere may be a desired outcome, it is pursued with the belief that it will eventually contribute to better student learning, better research, or better service for the students and the community in general. In addition, environmental measures can be used as meaningful proxies for outcomes, if the outcomes cannot be measured directly. For example, the number of library volumes acquired per student may serve as a proxy measure of student growth and development.

For your information, drafts of this inventory are available on request.

institutions and programs will provide the most meaningful and appropriate educational experiences. They should help institutional administrators and program managers account for the educational resources allocated and utilized in terms of the outcomes and benefits produced and the goals attained. Finally, they should provide legislators and statewide coordinating agencies with a better understanding of the intended as well as the unintended consequences of higher education.

The second criterion employed in developing the inventory is that it must provide a relatively complete characterization of an institution's programs. The variables listed in the outcomes inventory should include not only academic and instructional outcomes, but research and community service outcomes as well.

The inventory has been developed to include comprehensive lists of the outcome variables related to higher education programs and institutions. For the purpose of clarification, a variable in the context of the inventory is defined as some entity or quality capable of assuming one of a number of quantitative or qualitative values. For each outcome variable the inventory presents a definition or pertinent description, and it suggests a list of potential measures that can provide the appropriate evidence or necessary data for assessing the designated variables.

The current outcomes inventory incorporates reactions and suggestions from many individuals concerned with higher education. The following major categories define the structure of the inventory.

Section 1.0: Student Growth and Development Outcome Variables

1.1.0: Knowledge and Skills Development

1.2.0: Social Development

1.3.0: Personal Development

1.4.0: Career Development

Section 2.0: Development of New Knowledge and Art Forms Outcome Variables

Section 3.0: Community Development and Service Outcome Variables

3.1.0: Community Development

3.2.0: Community Service

3.3.0: Longer Term Community Effects

Characteristics of the Inventory

The outcomes inventory can be further described by identifying certain key characteristics and limitations.

Comprehensiveness: While every attempt has been made to develop a comprehensive list of variables, it is highly probable that certain important outcome variables have been overlooked. Or, more likely, in certain cases the descriptions may be interpreted to exclude elements they are intended to encompass.

It is recognized also that different individuals, institutions, and agencies will establish different subsets of the variables they view as relevant. Such lists undoubtedly will eliminate

certain variables, which will simply emphasize the fact that different individuals, institutions, and agencies have unique sets of objectives.

Disaggregation: If an attempt is made to map the inventory onto an institution's program structure, it may become apparent that incongruities exist at different levels of aggregation. For example, it is very difficult to associate many of the outcome variables, particularly those in the area of student values and attitudes, with any program classification below the entire campus except on a very arbitrary basis. A major reason for this aggregation problem is that higher education programs often produce joint outcomes. For example, a program in political science potentially affects students in terms of their "political" values and attitudes. Similarly, a program in history and sociology also can affect "political" values and attitudes. Consequently, attributing any change in students' "political" values and attitudes to a particular program or course is extremely difficult.

Redundancy: While developing a list of mutually exclusive outcome variables has been a key concern in the development of the inventory, the overlaps between variables in the inventory have not been entirely eliminated. For example, student values and attitudes toward "change and stability" are likely to intersect with "political" values and attitudes. Similarly, "vocational

preparation" characteristically intersects with "general knowledge" and "communication skills."

Neutral Scale: The variables' definitions and descriptions are not intended to connote value judgments. Efforts have been made to eliminate the use of such value-laden terms as "increase," "gain," and "benefit." Each user of the inventory is expected to view the variable descriptions as a neutral scale, to which he can attach his own unique values in terms of his preferred evaluation standards or his desired levels of performance. For example, one institution may want to increase the importance its students attach to "socioeconomic aspirations," while another institution may desire to decrease the degree of emphasis placed on this variable. It is recognized that an implied value judgment is built into the inventory by virtue of the level of aggregation utilized. That is, since "communication skills" is listed and "mathematical skills" is not, the unintended implication may be that communication is more important than mathematics. However, every attempt has been made to maintain a consistent level of aggregation throughout the inventory.

Measures: Developing a comprehensive list of outcome measures is a large-scale task, and it should be clear that the suggested measures are not all-inclusive and, for that matter, they may not be the best available. Thus, each user of the Inventory

should strive to identify or develop additional measures or proxy measures to gain as much information as possible about the outcome variables he is interested in assessing. The criteria for suggesting measures are based on judgments of their significance and practicality, primarily relative to data availability. Studies to determine the relationships between measures and their value, practicality, and interpretation remain to be accomplished.

OUTLINE OF THE INVENTORY OF
HIGHER EDUCATION OUTCOME VARIABLES AND MEASURES

1.0 Student Growth and Development

1.1.0 Knowledge and Skills Development

1.1.1.00 Knowledge Development

1.1.1.01 General Knowledge

1.1.1.02 Specialized Knowledge

1.1.2.00 Skills Development

1.1.2.01 Application and Knowledge Skills

1.1.2.02 Critical Thinking and Reasoning Skills

1.1.2.03 Creativity Skills

1.1.2.04 Communication Skills

1.1.2.05 Motor Skills

1.1.3.00 Knowledge and Skills Attitudes, Values, and Beliefs

1.1.3.01 Intellectual Disposition

1.2.0 Social Development

1.2.1.00 Social Skills

1.2.1.01 Interpersonal Participation

1.2.1.02 Leadership

1.2.1.03 Citizenship

1.2.2.00 Social Attitudes, Values and Beliefs

1.2.2.01 Political

1.2.2.02 Racial/Ethnic

1.2.2.03 Personal Ethics

1.2.2.04 Social Conscience

1.2.2.05 Socioeconomic Aspirations

1.2.2.06 Cultural Interest

1.3.0 Personal Development

1.3.1.00 Student Health

1.3.1.01 Physical Health

1.3.1.02 Mental Health

1.3.2.00 Student Personal Attitudes, Values, and Beliefs

1.3.2.01 Religious and Spiritual

1.3.2.02 Change/Stability

1.3.2.03 Self-Concept

1.4.0 Career Development

1.4.1.00 Career Preparation

1.4.1.01 Academic Preparation

1.4.1.02 Vocational Preparation

1.4.2.00 Career Attitudes, Values, and Beliefs

1.4.2.01 Achievement Orientation

1.4.2.02 Educational Aspirations

1.4.2.03 Educational Satisfaction

1.4.2.04 Vocational Aspirations

2.0 Development of New Knowledge and Art Forms

2.0.0.01 Discovery of New Knowledge

2.0.0.02 Interpretation and Application of New Knowledge

2.0.0.03 Reorganization of New Knowledge

3.0 Community Development and Service

3.1.0 Community Development

3.1.0.01 Community Educational Development

3.1.0.02 Faculty/Staff Educational Development

3.2.0 Community Service

3.2.0.01 Extension Services

3.2.0.02 Personal Services

3.2.0.03 Extramural Cultural and Recreational Services

3.2.0.04 Financial Impact on the Community

3.3.0 Longer Term Community Effects

3.3.0.01 Social Impact

3.3.0.02 Economic Impact

OUTCOME VARIABLES	POTENTIAL MEASURES
1.0 Student Growth and Development 1.1.0 Knowledge and Skills Development 1.1.1.00 Knowledge Development 1.1.1.01 General Knowledge The familiarity with and understanding of facts and principles across several broad fields. The student's breadth of knowledge.	Note: Many of the measures listed in 1.4.0 Career Development may also apply in 1.1.0. 1.1.1.01 General Knowledge Measures - Average student score on those items from tests (e.g., CLEP - General Exam; SAT Area Exam) that measure breadth of knowledge.* - Average student change in breadth of knowledge as determined by comparing entering general knowledge test scores to subsequent test scores (e.g., on CLEP, the GRE, or SAT Area Exams) after ___ years. - Average student-reported score on a scale measuring degree of satisfaction with breadth of knowledge (based on a student survey).

*Standardized measures are referenced at the end of this inventory.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.1.1.02 Specialized Knowledge The familiarity with and understanding of facts and principles in the particular fields in which the student elects to study. The student's depth of knowledge.	1.1.1.02 Specialized Knowledge Measures - Average student score on those items from tests (e.g., CLEP Subject Exams, or GRE Area Exams) that measure depth of knowledge in special fields of study. - Average student change in depth of knowledge by discipline area as determined by comparing entering specialized knowledge test scores to subsequent test scores (e.g., on CLEP Subject Exams or GRE Area Exams) after ___ years. - Number of graduates accepting employment in their major field of study as a percentage of total graduates in that field. - Number of students passing certification or licensing exams (e.g., bar exam, CPA) on first attempt as a percentage of all students taking the exam. - Average student-reported score on scale measuring the degree of satisfaction with their knowledge gain in specialized fields of study (based on a student survey). - Number of graduates accepted for study in post-baccalaureate degree programs as a percentage of those applying.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.1.2.00 Skill Development 1.1.2.01 Application of Knowledge Skills The ability to relate relevant general or specialized knowledge to a problem and to implement a solution. Also, the ability to locate, retain, and filter relevant knowledge. 1.1.2.02 Critical Thinking and Reasoning Skills The ability to formulate and analyze problems and to employ rational processes to achieve increased understanding (e.g., the recognition of biased points of view in a speech or a book; the recognition of cause-and-effect relationships).	1.1.2.01 Application of Knowledge Skills Measures - Average student score on those items from tests (e.g., CLEP Subject Exams, GRE or SAT Area Exams, or the OPI-Thinking Introversion Scale) that measure ability to apply general or specialized knowledge. - Average student change in ability to apply knowledge as determined by comparing entering ability test scores to subsequent test scores (e.g., on CLEP Subject Exams, the GRE or SAT Area Exams) after ____ years. - Average student and/or former student-reported score on a scale measuring degree of satisfaction with their ability to apply what they know both in breadth and depth (based on a student and/or former student survey). 1.1.2.02 Critical Thinking and Reasoning Skills Measures - Average student score on tests (e.g., OPI-Theoretical Scale; KIT-Critical Thinking Index, Critical Thinking Orientation Scale, or Critical Thinking Benefits Scale; AVL-Theoretical Scale) that measure ability to formulate and analyze problems. - Average student change in ability to formulate and analyze problems as determined by comparing entering critical thinking ability scores on tests (e.g., OPI-Theoretical Scale; KIT-Critical Thinking Index, Critical Thinking Orientation Scale, or Critical Thinking Benefits Scale; AVL-Theoretical Scale) to subsequent test scores after ____ years.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.1.2.03 Creativity Skills The ability to design, produce, or otherwise bring into existence original perspectives, explanations, and implementations (e.g., the production of unique communication; the development of an effective plan or solution to a problem; or the creation of works of art).	- Average student-reported score on scale measuring degree of satisfaction with their ability to apply what they know both in breadth and depth (based on a student survey). - Percentage of courses taken that are classified as emphasizing critical thinking and reasoning. 1.1.2.03 Creativity Skills Measures - Average student score on tests (e.g., OPI-Complexity of Outlook Scale; KIT-Art Scale, Music Scale, Literature Scale, or Drama Scale, AVL-Aesthetic Scale) that measure the ability to create original perspectives, explanations, and implementations. - Average student change in ability to create original perspectives, explanations, and implementations as determined by comparing entering creative ability scores on tests (e.g., OPI-Complexity of Outlook Scale; KIT-Art Scale, Music Scale, Literature Scale, or Drama Scale; AVL-Aesthetic Scale) to subsequent test scores after ____ years. - Average student-reported score on a scale measuring degree of satisfaction with their ability to create original perspectives, explanations, and implementations (based on a student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Percentage of courses taken that are classified as emphasizing creativity. - Number of patents awarded/copyrights obtained by former students within the past ____ years (based on a former student survey).
1.1.2.04 Communication Skills The ability or competence to read, write, speak, and listen. The ability to convey information, attitudes, emotions, etc.; and also the ability to receive and interpret communications. These skills also encompass nonoral, nonwritten expression and perception.	1.1.2.04 Communication Skills Measures - Average student score on tests that measure the ability to communicate. - Average student change in ability to communicate as determined by comparing entering scores on tests of communicative ability to subsequent test scores after ____ years. - Percentage of courses taken that are classified as emphasizing communication skills. - Number of students participating in debate, encounter groups, etc., as a percentage of all students.
1.1.2.05 Motor Skills The ability or competence in tasks requiring physical dexterity and skill.	1.1.2.05 Motor Skills Measures - Average student score on tests that measure motor skills. - Average student change in motor skills as determined by comparing entering skill test scores to subsequent test scores after ____ years. - Number of students participating in intramural and varsity athletics as a percentage of all students. - Percentage of courses taken that are classified as emphasizing motor skills.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.1.3.00 Knowledge and Skills Attitudes, Values, and Beliefs	
1.1.3.01 Intellectual Disposition The desire to continue self-initiated study and inquiry for its own sake and/or for personal enjoyment.	1.1.3.01 Intellectual Disposition Measures - Average student change in perception and evaluation of their interest in continued self-initiated study and inquiry as determined by comparing entering test scores on (e.g., AVL-Intellectual Scale; KIT-Intellectual Orientation Scale) to subsequent test scores after ____ years. - Percentage of students taking noncredit, independent study, or special courses. - Average student-reported score on a scale measuring their evaluation and perception of the amount of learning that took place outside of formal instruction (based on a student survey). - Number of books, records, tapes, and other library materials checked out per student over a specified period of time.
1.2.0 Social Development	
1.2.1.00 Social Skills	
1.2.1.01 Interpersonal Participation The ability to live and interact with others. This variable may be further disaggregated into such categories as cooperation, friendly companionship and organizational skills; the ability to handle stress, isolation, and bias.	1.2.1.01 Interpersonal Participation Measures - Average number of memberships per student and/or former student in social, charitable, political, or civic organizations (based on a student and/or former student surveys).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Average number of awards and citations earned per student and/or former student for social contributions (based on a student and/or former student survey). - Student and/or former student perceptions and evaluations of their interpersonal participation as determined by selected measures (e.g., AVL-Social Scale; CUES-Community Scale; F-Scale; KIT-Interpersonal Index; Learning: Experiential Scale and Feeling About Other People Scale; ISS-Social Subscale of Institutional Goals Section). - Average number of friends and acquaintances reported per student (based on a student survey).
1.2.1.02 Leadership The ability to establish directions or courses of action and influence others to follow.	1.2.1.02 Leadership Measures - Average number of positions in local, state, and federal government held by students and/or former students (based on a student and/or former student survey). - Average number of offices in social, charitable, political, or civic organizations held by students and/or former students (based on a student and/or former student survey). - Students and/or former students participating in special social development programs; e.g., the Peace Corps and VISTA (based on a student and/or former student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Percentage of former students in management positions by the __th year following graduation (based on a former student survey). - Student and/or former student perceptions and evaluations of their leadership ability as determined by selected measures (e.g., AVL-Political; F-Scale).
1.2.1.03 Citizenship The ability to perform relative to the rights, duties, and privileges of a member of a community, state, or nation.	1.2.1.03 Citizenship Measures - Percentage of students and/or former students who voted in the last general election (based on a student and/or former student survey). - Average amount of monetary contributions per individual made to political, religious, and social organizations or special interest groups over past year relative to income category (based on a student and/or former student survey). - Student and/or former student perceptions and evaluations of their performance as citizens as determined by selected measures (e.g., KIT-Community Affairs Scale, National and State Politics Scale, and International and Intercultural Affairs Scale). - Average number of hours per month devoted to political, religious, and social organizations or special interest groups over the past year per student (based on a student and/or former student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.2.2.00 Social Attitudes, Values, and Beliefs	
1.2.2.01 Political Attitudes toward systems of government, including the processes, institutions, conventions, and the level of political participation.	1.2.2.01 Political Attitude Measures - Percentage of students and/or former students belonging to or holding office in political organizations (based on a student and/or former student survey). - Student and/or former student perceptions and evaluations of their political attitudes and beliefs as determined by selected measures (e.g., AVL-Political Scale; F-Scale; KIT-National and State Politics Scale, Community Affairs Scale, National Status and World Security Scale, Freedom of Expression Scale, Societal Viewpoints Scale). - Percentage of former students utilizing mechanisms of the political process; e.g., petitions circulated, hearings attended, letters written, lobbying activities (based on a former student survey).
1.2.2.02 Racial/Ethnic Attitudes toward races or national origins other than one's own.	1.2.2.02 Racial/Ethnic Attitude Measures - Student and/or former student perceptions and evaluations of their racial and ethnic attitudes and beliefs as determined by selected measures (e.g., KIT-Minority Problems Scale; E-Scale).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Number of students and/or former students who are partners in an interracial marriage as a percentage of survey sample (based on student and/or former student surveys). - Percentage of elected student offices held by members of ethnic minorities.
1.2.2.03 Personal Ethics Ethical and moral values that affect an individual's actions and thoughts toward others. The sense of what is right or wrong in one's conduct and motives in dealings between individuals and groups.	1.2.2.03 Personal Ethics Measures - Student and/or former student perceptions and evaluations about their ethical and moral values as determined by selected measures (e.g., AVL-Religious Scale and Social Scale; KIT-Feelings About Other People Scale). - Percentage of former students arrested on felony and misdemeanor charges during the last ___ years (based on former student survey).
1.2.2.04 Social Conscience The concern for human welfare. The importance placed on human interests, values, and conditions.	1.2.2.04 Social Conscience Measures Note: Many of the measures suggested in 1.2.1.01 Interpersonal Participation and 1.2.1.03 Citizenship also apply here. - Student and/or former student perceptions and evaluations about their concern for human welfare as determined by selected measures (e.g., AVL-Social Scale; KIT-Societal Viewpoints Scale, Human Relations Scale, Societal Priorities Scale; OPI-Social Maturity Scale).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.2.2.05 Socioeconomic Aspirations The importance attached to one's socioeconomic status. 1.2.2.06 Cultural Interest The interest in and acquaintance with arts, manners, scholarly pursuits, and other qualities that characterize civilizations.	1.2.2.05 Socioeconomic Aspirations Measures - Average student and/or former student-reported score on scales measuring perceptions and evaluations of their current and desired social and economic level (based on a student and/or former student survey). 1.2.2.06 Cultural Interest Measures - Student and/or former student perceptions and evaluations of their interest in culture as determined by selected measures (e.g., KIT-Educational Benefits: Humanistic Scale). - Percentage of courses (credit and/or noncredit) taken that are classified as emphasizing cultural interests.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.3.0 Personal Development 1.3.1.00 Student Health 1.3.1.01 Physical Health The physical well-being of students and/or former students. 1.3.1.02 Mental Health The mental well-being of students and/or former students. 1.3.2.00 Student Personal Attitudes, Values, and Beliefs 1.3.2.01 Religious and Spiritual Attitudes toward and adherence to the conventions, practices, and teachings of religious organizations or sects.	1.3.1.01 Physical Health Measures - Percentage of students and/or former students reporting physical illnesses, by type of illness (based on a student and/or former student survey). 1.3.1.02 Mental Health Measures - Percentage of students and/or former students reporting mental illnesses, by type of illness (student and/or former student survey). - Percentage of students participating in special mental health counseling programs. 1.3.2.01 Religious and Spiritual Attitude Measures - Percentage of students and/or former students belonging to or holding office in religious organizations (based on a student and/or former student survey). - Student and/or former student perceptions and evaluations of their religious and spiritual attitudes and beliefs as determined by selected measures (e.g., AVL-Religious Scale; KIT-Religion Scale and General Values & Ideologies Scale; OPI-Religious Liberalism Scale; T-CR). - Percentage of students regularly attending religious services.

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Average monetary contribution per former student to religious organizations relative to income category (based on a former student survey).
1.3.2.02 Change/Stability Attitudes, toward new and different ideas, relationships, products, or methods. The desire to introduce, avoid, or be associated with changes.	1.3.2.02 Change/Stability Attitude Measures - Student and/or former student perceptions and evaluations about their attitudes and beliefs toward new and different things as determined by selected measures (e.g., KIT-Areas and Agents of Change Scale, Involvement in Campus Reforms Scale; Rokeach Dogmatism Scale). - Average number of changes in employment per former student during the past ____ years (based on a former student survey).
1.3.2.03 Self-Concept The feeling and acceptance of oneself as having basic worth and value.	1.3.2.03 Self-Concept Measures - Student and/or former student perceptions about oneself as determined by selected measures (e.g., KIT-Feelings About Self Scale).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.4.0 Career Development 1.4.1.00 Career Preparation 1.4.1.01 Academic Preparation The ability to seek, gain, and maintain a particular level and kind of academic pursuit.	1.4.1.01 Academic Preparation Measures - Average number of awards and citations received per graduate for academic performance (based on a former student survey). - Percentage of graduates working toward or receiving an advanced degree or certificate ____ years after graduation (based on a former student survey). - Percentage of graduates enrolled in graduate school ____ years after graduation (based on a former student survey). - Average student and/or former student-reported score on a scale measuring the degree of satisfaction with their academic performance (based on a student and/or former student survey). - Number of dropouts during the past year as a percentage of their academic rank or the total institution enrollment. - Number of students graduating from the institution after ____ years as a percentage of the entering class. - Number of graduates who transferred in as a percentage of total graduates for the year.

OUTCOME VARIABLES	POTENTIAL MEASURES
1.4.1.02 Vocational Preparation The ability to seek, gain, and maintain a particular level and kind of employment.	- Percentage of students changing major (lower division, upper division, and/or graduate) during the past year. 1.4.1.02 Vocational Preparation Measures - Percentage of former students employed within ____ days after graduation (based on a former student survey). - Average first salary of former students (based on a former student survey). - Average income category for former students after ____ years (based on a former student survey). - Percentage of dropouts employed within ____ days after dropping out (based on a survey of dropouts). - Average score of dropouts on a scale measuring the degree of satisfaction with their vocational performance (based on a survey of dropouts). - Average number of professional awards and citations received by former students (based on a former student survey). - Percentage of former students in management positions by the ____ th year following graduation (based on a former student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.4.2.00 Career Attitudes, Values, and Beliefs 1.4.2.01 Achievement Orientation The importance placed upon accomplishments; i.e., successfully completing work that is valued by the individual and/or society. Impact or benefit as viewed by the student and/or the larger society.	- Average score reported by former students on a scale measuring satisfaction with their vocational performance (based on a former student survey). - Number of former students who desire to have their children follow the same career field as a percentage of the total number of former students surveyed (based on a former student survey). - Average number of voluntary/involuntary changes in employment over given time periods per former student (based on a former student survey). - Percentage of total graduates employed in-state versus out-of-state. - Average number of voluntary/involuntary changes in career field over given time periods per former student (based on a former student survey). 1.4.2.01 Achievement Orientation Measures - Student and/or graduate perceptions and evaluations of achievement as determined by selected measures (e.g., KIT-Feelings About the Future Scale).

OUTCOME VARIABLES	POTENTIAL MEASURES
1.4.2.02 Educational Aspirations The educational degree and/or competency level desired and valued by students and/or graduates.	1.4.2.02 Educational Aspirations Measures - Percentage of students identifying the ___ degree (none, associate, bachelor's, master's, doctoral, other) as the highest degree planned (based on a student survey). - Percentage of graduates working toward or receiving an advanced degree ___ years after graduation (based on a former student survey).
1.4.2.03 Educational Satisfaction The degree of student satisfaction with their educational experience.	1.4.2.03 Educational Satisfaction Measures - Percentage of former students who intend to send their children to the same school (based on a former student survey). - Average amount of alumni gifts ____ years after their graduation. - Average student and/or former student-reported score on a scale measuring the degree of satisfaction with their educational experience (based on a student and/or former student survey).
1.4.2.04 Vocational Aspirations The level of attainment in a profession desired by students and/or graduates.	1.4.2.04 Vocational Aspirations Measures - Average first salary expectations of students (based on a student survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Percentage of students and/or former students seeking certain professional levels in society (based on a student and/or former student survey).
2.0 Development of New Knowledge and Art Forms*	
2.0.0.01 Discovery of New Knowledge The identification and development of new knowledge, theories, and products without regard to practical application.	2.0.0.01 Discovery of New Knowledge Measures - Average number of basic research publications per student, former student, and/or faculty member over a given time period (based on a student, former student, and/or faculty survey). - Average number of times a given basic research publication is cited in bibliographies of other authors over a given time period (e.g., based on publications listed in Science Citation Index). (Note: both frequency and the time interval over which citations are made should be considered.) - Average percentage of faculty time spent in selected basic research activities (e.g., NCHEMS Faculty Activity and Outcome Survey - Section B.1 Specific Research Projects). - Average number of proposals funded for the development of new ideas and products during _____ year(s). - Total dollar amount of gifts and/or grants received for the development of new ideas and products without concern for practicality as a percentage of total budget for ____ year(s).

*The current inventory does not contain variables and measures related to the development of New Art Forms.

OUTCOME VARIABLES	POTENTIAL MEASURES
2.0.0.02 Interpretation and Application of New Knowledge The development and use of new knowledge, theories, and products with regard to practical application.	2.0.0.02 Interpretation and Application of New Knowledge Measures - Average number of applied research, development, and evaluation publications per student, graduate, and/or faculty member (based on a student, former student, and/or faculty survey). - Average percentage of time spent by faculty in selected applied research, development, and evaluation activities (based on NCHEMS Faculty Activity and Outcome Survey - B.1 Special Research Projects, E.2 Professional Service and Advice, and F.1 Academic Activity Outside the Institution). - Average number of awards and citations received per student, former student, and/or faculty member for applied research, development, and evaluation efforts (based on a student, former student, and/or faculty survey). - Average number of applied research, development, and evaluation proposals funded during past ___ year(s). - Total dollar amount of gifts, contracts, or grants received for applied research, development, and evaluation as a percentage of total budget for ___ year(s).

OUTCOME VARIABLES	POTENTIAL MEASURES
	- Average number of patents and/or copyrights received per student, former student, and/or faculty member over a given time period (based on a student, former student, and/or faculty survey).
2.0.0.03 Reorganization of New Knowledge The synthesis of existing theories, findings, and statements in order to present existing knowledge in a new form designed to be more readily comprehensible or usable (e.g., new textbooks, written articles, and oral communications).	2.0.0.03 Reorganization of New Knowledge Measures - Average number of textbooks, monographs, etc., published per faculty member (based on a faculty survey). - Average percentage of faculty time spent in reorganizing existing knowledge (based on NCHEMS Faculty Activity and Outcome Survey - Section A.4 Course and Curriculum Development). - Average number of films, taped lectures, etc., developed per faculty member (based on a faculty survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
3.0 Community Development and Service 3.1.0 Community Development 3.1.0.01 Community Educational Development The growth and development of members of the community who are not working toward a degree or certification, but who are taking advantage of continuing education opportunities offered. 3.1.0.02 Faculty/Staff Educational Development The growth and development of faculty and staff either through their instruction, research, or management activities or through the continuing education opportunities offered.	3.1.0.01 Community Educational Development Measures - Note: Measures listed in 1.1.1.01 General Knowledge, 1.1.1.02 Specialized Knowledge, 1.1.2.01 Application of Knowledge, 1.1.2.02 Critical Thinking and Reasoning Skills, and 1.1.2.03 Creativity can also be utilized as indicators of Community Educational Development. - Percentage of students in various instructional programs who are classified as nonmatriculating. 3.1.0.02 Faculty/Staff Educational Development Measures - Percentage of faculty/staff who are taking courses in the institution. - Percentage of faculty time spent in selected activities (based on NCHEMS Faculty Activity and Outcome Survey - B.2 General Scholarship and Creative Work, F.1 Academic Activity Outside the Institution). - Faculty and staff perceptions and evaluations of their educational growth and development (based on a faculty/staff survey).

OUTCOME VARIABLES	POTENTIAL MEASURES
3.2.0 Community Service 3.2.0.01 Extension Services The extent to which the community receives direct assistance and services of various types from the primary programs of the institution (e.g., agriculture extension service, other noninstructional extension activities, faculty/staff consulting).	3.2.0.01 Extension Services Measures - Average percentage of faculty time spent in selected activities (based on NCHEMS Faculty Activity and Outcome Survey - E.2 Professional Service and Advice, F.1 Academic Activity Outside the Institution, F.2 Paid Professional Service). - Estimated replacement value of specific extension services received by individuals or organizations that receive the services. - Ratio of total income for extension services to total budget for extension services. - Income produced through extension services, as a percentage of the cost of offering the service(s). - Amount of release time granted faculty members per year for community service.

OUTCOME VARIABLES	POTENTIAL MEASURES
3.2.0.02 Personal Services The extent to which individuals in the community receive direct personal services of various types through the support programs and facilities of the institution (e.g., medical clinics that serve the general community, nursery schools, access to the library, and computer center).	3.2.0.02 Personal Services Measures - Number of individuals not associated with the institution who were served by a particular institutional support program (e.g., the computing center, the library, etc.) as a percentage of the total number of individuals served over a given time period. - Estimated monetary value of specific personal services offered relative to other comparable services offered elsewhere.
3.2.0.03 Extramural Cultural and Recreational Services The availability and utilization of the recreational and cultural opportunities offered through the institution to the community (e.g., sporting events, the performing arts, museum exhibits, and concerts).	3.2.0.03 Extramural Cultural and Recreational Services Measures - Estimated number of nonstudents, nonfaculty, and nonstaff attending selected extramural events as a percentage of the total number attending.

OUTCOME VARIABLES	POTENTIAL MEASURES
3.2.0.04 Financial Impact on the Community The economic benefits or costs directly and indirectly accruing to the community as a result of the operation of the institution, including such elements as: 1) purchases of goods and services by the institution, its students, and its faculty, 2) students available as employees, 3) drawing power of the community for industry and as a place of residence for employees.	3.2.0.04 Financial Impact on the Community Measures - Total dollar amount of goods and services purchased by the institution from a particular sector of the community during the past year. - Estimated average dollar amount of expenditures by students in the community. - Number of students employed in businesses, agencies, and organizations in the community as a percentage of the total student enrollment (based on student survey). - Total dollar amount of the institution's payroll as a percentage of the estimated total community payroll.

OUTCOME VARIABLES	POTENTIAL MEASURES
3.3.0 Longer Term Community Effects	
3.3.0.01 Social Impact The long-term social effects of the institution, primarily through its former students, on the community of the institution.	3.3.0.01 Social Impact Measures Note: Many of the measures listed in Section 1.2.0 Social Development and 1.3.0 Personal Development can be applied equally well over long time periods and also to children of former students if attempts are made to identify intergenerational effects.
3.3.0.02 Economic Impact The long-term economic effect of the institution, primarily through its former students, on the community.	3.3.0.02 Economic Impact Measures Note: Many measures listed in Sections 1.2.2.05 Socioeconomic Aspirations, 1.4.1.02 Vocational Preparation, 1.4.2.04 Vocational Aspirations, and the research-oriented outcome indicators in Section 2.0 Development of New Knowledge and Art Forms can be applied equally well over long time periods.

KEY

AVL	Allport, G. W.; Vernon, P. E.; and Lindzey, G. A Study of Values: Manual. 3rd ed. Boston: Houghton Mifflin, 1960.
CCI	Stern, G. G. Scoring Instructions and College Norms for the Activities Index and the College Characteristics Index. Syracuse N.Y.: Psychological Research Center, Syracuse University, 1963.
CLEP	Educational Testing Service. Tests and Services: College Level Examination Program. Berkeley: College Entrance Examination Board.
CUES	Pace, C. R. Preliminary Technical Manual: College and University Environment Scales. Princeton: Educational Testing Service.
E and F Scales	Adorno, T. W.; Frenkel-Grunswick, E.; Levinson, D. J.; and Sanford, R. N. The Authoritarian Personality. New York: Harper. 1950.
GRE	Educational Testing Service. The Graduate Record Examinations. The Area Tests, Aptitude Test, Advanced Tests. Princeton, N. J.: Educational Testing Service, current date.
ISS	American College Testing Program. Manual for the ACT Institutional Self-Study Survey. Iowa City: Author, 1969.
KIT	Higher Education Program Staff. Higher Education Measurement and Evaluation KIT. Field Ed. Los Angeles: Center for the Study of Evaluation, University of California, 1971.
NCHEMS FAOS	Romney, Leonard C. Faculty Activity Procedures Manual. Boulder, Colo.: Western Interstate Commission for Higher Education, forthcoming.
OPI	Center for the Study of Higher Education. Omnibus Personality Inventory: Research Manual. Berkeley: University of California, 1962.
Rokeach Dogmatism Scale	Rokeach, M. The Open and Closed Mind. New York: Basic Books, 1960.
SAT	Educational Testing Service. College Entrance Examination Board Admissions Testing Program: Scholastic Aptitude Test. Achievement Tests, Supplementary Achievement Tests. Princeton, N.J.: Author, current date.
Science Citation Index	Published by the Institute for Scientific Information, Philadelphia, Pennsylvania.
T-CR	Thurstone, H. H., and Chave, E. J. The Measurement of Attitude: A Psychological Method and Some Experiments with a Scale for Measuring Attitudes Toward the Church. Chicago: University of Chicago Press, 1929

REFERENCES

Brann, James. "The Chairman: An Impossible Job About to Become Tougher," in Brann, James, and Emmet, Thomas A., Editors, The Academic Department or Division Chairman: A Complex Role. Detroit, Michigan: Balamp Publishing, 1972.

Collier, Douglas J. Higher Education Finance Manual: Field Review Edition. Boulder, Colorado: Western Interstate Commission for Higher Education, 1974.

Dressel, Paul L.; Johnson, F. Craig; and Marcus, Philip M. The Confidence Crisis. San Francisco, California: Jossey-Bass Inc., Publishers, 1970.

Dyer, James S. "Academic Resource Allocation Models at UCLA." Los Angeles, California: Western Management Science Institute, University of California, April, 1973. Paper prepared for presentation at the Conference on Decision Sciences in Academic Administration, Kent State University, May 10-12, 1973.

Featherstone, Richard L. The Development of Management Systems for the Academic Department. Boulder, Colorado: Western Interstate Commission for Higher Education, 1972.

Gulko, Warren W. Program Classification Structure. First Edition. Boulder, Colorado: Western Interstate Commission for Higher Education, January, 1972.

Haight, Michael J., and Manning, Charles W. Induced Course Load Matrix Generator: Systems Documentation. Boulder, Colorado: Western Interstate Commission for Higher Education, 1972.

Haight, Michael J., and Martin, Ronald. Student Data Module Reference Manual. Boulder, Colorado: Western Interstate Commission for Higher Education, forthcoming in 1975.

Hoenack, Stephen A.; Meagher, Patrick D.; Weiler, William C.; and Zillgitt, Ronald A. "University Planning, Decentralization, and Resource Allocation." Socio-Economic Planning Science, 1974, Vol. 8, pp. 257-272.

Huckfeldt, Vaughn E. Changes in Higher Education. Boulder, Colorado: Western Interstate Commission for Higher Education, 1972.

REFERENCES-Continued

Key, William. "The Department Chairman: One Man's Viewpoint," Monograph #15. Boulder, Colorado: Western Interstate Commission for Higher Education. A paper prepared for OREGON/WICHE Conference (The Department Chairman and Undergraduate Instruction: Problems and Possibilities), 1970.

Johnson, Richard S., and Huff, Robert A. Information Exchange Procedures Cost Study Procedures, Technical Report #65. Boulder, Colorado: Western Interstate Commission for Higher Education, January, 1975.

Manning, Charles W. and Romney, Leonard C. Faculty Activity Analysis: Procedures Manual, Technical Report #44. Boulder, Colorado: Western Interstate Commission for Higher Education, July, 1973.

Micek, Sidney S., and Wallhaus, Robert A. An Introduction to the Identification and Use of Higher Education Outcome Information, Technical Report #40. Boulder, Colorado: Western Interstate Commission for Higher Education, March, 1973.

Topping, James R. Cost Analysis Manual, Technical Report #45. Boulder, Colorado: Western Interstate Commission for Higher Education, 1974.

Topping, James R., and Miyataki, Glenn K. Program Measures, Technical Report #35. Boulder, Colorado: Western Interstate Commission for Higher Education, February, 1973.

Wallhaus, Robert A., and Micek, Sidney S. Higher Education Program Assessment Profiles: A Preliminary Draft. Boulder, Colorado: Western Interstate Commission for Higher Education, August, 1972.

Wing, Paul. Higher Education Enrollment Forecasting: A Manual for State-Level Agencies. Boulder, Colorado: Western Interstate Commission for Higher Education, 1974.

Yuker, Harold E. Faculty Workload: Facts, Myths, and Commentary. Washington D.C.: American Association for Higher Education, 1974.

Advisory Structure for the
NATIONAL CENTER FOR HIGHER EDUCATION MANAGEMENT SYSTEMS at WICHE

BOARD OF DIRECTORS

James Furman (Chairman)
Executive Coordinator, Washington Council on Higher Education

George Kaludis (Vice Chairman)
Vice Chancellor, Operations and Fiscal Planning, Vanderbilt University

Rutherford H. Adkins
Vice President, Fisk University

Fred E. Balderston
Chairman, Center for Research in Management Science and Professor of Business Administration, University of California, Berkeley

Max Bickford
Executive Officer
Kansas Board of Regents

Allen T. Bonnell
President, Community College of Philadelphia

Ronald W. Brady
Vice President for Planning and Allocation
University of Illinois

Lattie F. Coor
Vice Chancellor
Washington University

Kenneth Creighton
Deputy Vice President for Finance
Stanford University

Ralph A. Dungan
Chancellor, New Jersey Department of Higher Education

Alan Ferguson
Executive Director, New England Board of Higher Education

James F. Gollattscheck
President, Valencia Community College

Paul E. Gray
Chancellor
Massachusetts Institute of Technology

Freeman Holmer
Vice Chancellor for Administration
Oregon State System of Higher Education

Douglas MacLean
Vice President for Management Services, University of Houston

Robert Mautz
Chancellor, State University System of Florida

William R. McConnell
Executive Secretary, New Mexico Board of Educational Finance

Donald McNeil
Chancellor
University of Maine

James L. Miller
Professor, Center for the Study of Higher Education, The University of Michigan

G. Theodore Mitau
Chancellor, The Minnesota State College Board

Gordon Osborn
Assistant Vice Chancellor for Management, State University of New York, Central Administration

James A. Robinson
President
Macalester College

Keith W. Stoehr
District Director
Gateway Technical Institute

Jack F. Tolbert
Director
The Bryman-Medix School

Marvin Wachman
President
Temple University

Fred Wellman
Executive Secretary, Illinois Junior College Board